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COMPREHENSIVE SITE REPORT
HRANICA WASTE DISPOSAL SITE
SARVER, PENNSYLVANIA

PREPARED FOR

PPG INDUSTRIES, INC.
ONE PPG PLACE
PITTSBURGH, PENNSYLVANIA

PREPARED BY

IT CORPORATION
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1.0 INTRODUCTION

In July 1986, PPG Industries, Inc. (PPG), requested IT Corporation (IT) to prepare a comprehensive site report for the Hranica site located in the south-eastern part of Butler County in western Pennsylvania. PPG further requested that this report to follow the U.S. Environmental Protection Agency's (U.S. EPA) Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) remedial investigation (RI) format(1)*.

The Hranica site was used for municipal waste disposal and for the disposal of PPG and Aluminum Company of America (ALCOA) wastes from 1966 to 1974. Site disposal practices have been investigated by various state and local agencies. In 1983-1984, PPG and ALCOA voluntarily conducted an extensive surface cleanup of the site and removed waste-containing drums, pails, tanks, and other surface-contaminated materials. These materials were hauled to secure landfills for disposal. As a result of these activities, a significant amount of data has been generated and is available for the site. The present comprehensive site report compiles and organizes the existing data in the format described in IT's work plan(2) submitted to PPG on July 8, 1986. The report is organized in CERCLA's RI(3) format.

The comprehensive site report presented here includes the review of data and major reports from various source documents which include:

- o PPG files located in offices in the Blawnox RIDC Park and One PPG Place, Pittsburgh, Pennsylvania
- o ALCOA files located in the ALCOA Building, Pittsburgh, Pennsylvania
- o Pennsylvania Department of Environmental Resources (PADER) files located in Meadville, Pennsylvania
- o U.S. EPA Region III files located in Philadelphia, Pennsylvania
- o D'Appolonia Waste Management Services, Inc. (D'Appolonia)(1), files located in Monroeville, Pennsylvania

*See references at end of text.

(1)D'Appolonia was acquired by IT in February 1984.

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- o Ecology and Environment, Field Investigation Team (FIT) Report No. TDD-F3-8008-06, U.S. EPA No. PA-123-133, Contract No. 68-01-6056
- o Penn Environmental Consultant (PEC) (a division of NUS Corporation [NUS]) Report, July 1982 under contract with PPG (PEC Project No. 6110-03)
- o Earth Sciences Consultants (ESC) - Quarterly Ground Water Monitoring Reports from 1984 to 1986
- o U.S. EPA GCA Contractor Technology Division (GCA) Draft Report - (Contract No. 68-01-6769; Work Assignment No. 84-123).

The documents reviewed by IT consist of several hydrogeologic and analytical packages, memorandums, and correspondence between U.S. EPA, state regulatory agencies, and potentially responsible parties involved at the site. The documents reviewed by IT also contain numerous pieces of correspondence dealing with reports, proposals, transmittal letters, and peer review forms, some of which contain technical information.

The report is self-contained with supporting documents attached as appendices. The appendices include the following documents:

- o Appendix A - Figures
- o Appendix B - D'Appolonia - Technical Proposal, Waste Site Cleanup, Hranica Landfill, Sarver, Pennsylvania, February 1983
- o Appendix C - D'Appolonia - Preparedness, Prevention, and Contingency Plan, Waste Disposal Site Cleanup, Hranica Site, Buffalo Township, PA, July 1983.
- o Appendix D - D'Appolonia Laboratory Analysis Protocol, Waste Disposal Site Cleanup, Hranica Site, Buffalo Township, PA, July, 1983.
- o Appendix E - Ecology and Environment FIT Data, 1981
- o Appendix F - D'Appolonia Ash Sampling Program
- o Appendix G - D'Appolonia Fracture Trace Analysis and PCB Cleanup

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- o Appendix H - Earth Sciences Consultants Ground Water Proposal and QA/QC Program
- o Appendix I - Hranica Document Index
- o Appendix J - Drawings.

Studies of the site have been performed by the FIT Contractor, Ecology and Environment(4), in 1981 and by PEC(5) in 1982. The FIT 1981 report(4) consists of precleanup site inspection and trip reports, with surface and ground water samples from springs and seeps around the site. The 1982 PEC study(5) is more comprehensive and contains the results of subsurface investigations and sampling of ground and surface water, with chemical analyses of the samples taken and evaluation of remedial alternatives. Site cleanup work was performed by D'Appolonia(6) in 1983 and 1984. D'Appolonia prepared several documents detailing the drum removal, drum sampling, and initial cleanup procedures used at the site. This included the technical proposal; Preparedness, Prevention, and Contingency Plan; and Laboratory Analysis Protocols (Appendices B, C, and D).(6) After site cleanup, ESC (PPG's present contractor) prepared and implemented quarterly ground water monitoring. Several sampling results from ESC reports(8) were included in this review. Precleanup split sampling results from PADER, IT, and PEC are also included in this report.

This comprehensive site report summarizes the past history of the site, contaminant identification, potential problems, corrective actions taken by PPG, and continued ground water monitoring program. The surface water, sediment, soil, and ground water data collected to date by PPG, ALCOA, IT, and PADER have been tabulated and attached.

2.0 SITE BACKGROUND

The Hranica site is a 15-acre area located on a hilltop on Ekastown Road, near Sarver, in Butler County, Pennsylvania (Figure 1-1, Appendix A).

The site was initially used as a municipal landfill in 1966 and was operated by Joseph and William Hranica. PPG and ALCOA wastes started arriving on site in 1966 and 1968, respectively, and continued until 1974. In 1970, when the

jurisdiction of the landfill was passed from the Butler County Health Department to PADER, the landfill came under closer scrutiny. In February 1973, William Hranica signed a consent decree with PADER permitting the operation of the site under a schedule of actions required to achieve compliance for solid waste disposal. In 1974, as advised by a Hranica attorney, all activities at the site were ceased.(7) The site remained inactive until 1983-84 when PPG and ALCOA hired D'Appolonia and conducted an extensive site cleanup.

2.1 SITE DESCRIPTION

The Hranica site occupies the head of a small east-northeast trending ravine (along an unnamed tributary of Little Bull Creek) and part of the surrounding hilltop.

Drawing 165-03-S1 (Appendix J) is a topographic map which shows existing monitoring well locations as well as other sampling locations. Two geologic cross-sections of the ravine (A-A' and B-B') appear in Drawing 165-03-R1 (Appendix J) along with a section location map.

There is a relatively flat upland area at the head of the ravine which constitutes the basin drainage divide. This drainage divide surrounds the site except on the east-northeast side. A large, unnamed tributary of McDowell Creek flows south in a large valley just west of this divide. To the south-east of the site, another small valley drains east-southeastward towards Little Bull Creek. A broad, dry ravine north of the site opens to the east-northeast. The flat upland area which was created as a result of previous sanitary and solid waste disposal operations was believed to be one of the main drummed waste storage areas. The northern end of the bench (Figure 2-6, Appendix A)(6) was also used for drum storage. The southwest corner of the site above the flat upland area was located as a second waste storage area. The south side of the access road (Hranica Drive) which runs east to west along the northern side of the ravine was used for waste storage, in the form of drum stockpiles. Immediately downslope of the drum stockpiles were wedges and piles of garbage dumped off the slopes. Many of these wedges are believed to represent small-scale landslides indicative of unstable slope and soil conditions.(4,6)

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Cornfields cover the ridgetop areas and adjoining slopes to the north and west of the site and an orchard (Pajer orchard) is located south of the site.

2.2 DISPOSAL PRACTICES

In 1966, when the Hranicas notified the Butler County Health Department of their intention to dispose of PPG waste, the disposal method, according to Mr. Hranica, consisted of a combination of incineration and surface impoundment storage. Due to air pollution from waste burning and at the request of the Butler County Health Department, Mr. Hranica started disposing of wastes directly into impoundments created by scooping out the earth in several locations.(7) The Department advised Hranica that the hillside's sandstone nature was such that all dumped materials would be readily absorbed.(7)

Five weeks after this disposal practice began, apparent spring water contamination was discovered on the property of a neighboring farmer, John Obringer. The contamination was attributed to solvent and paint disposal because of the odor present. According to Mr. Hranica, Dr. Grover H. Emerich, PADER hydrogeologist, reported that the migration of contamination was attributed to the two geologic faults extending through the site. According to Butler County records, Mr. Hranica stated that a fissure was discovered in ground which he estimated to be 100 feet deep.(7) One of the waste impoundments was apparently located 12 feet from the suspected faults.(7)

After the spring contamination incident, Mr. Hranica purchased a number of large metal vats (some of which had refractory liners) and began incinerating the wastes in them. Residue from this operation was removed and stored in open piles on the site. Concurrent with this operation, materials were also burned in their original drums.(7) After the volatiles were combusted, a hardened residue remained in the bottom of the drums or was disposed on the ground as an ash pile on the north end of the site.

2.3 REGULATORY AGENCY ACTIONS

The Butler County Health Department was initially responsible for regulating the landfill operation.

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Regulatory responsibility was transferred from the Butler County Health Department to PADER in the early 1970s. The operation had been under permit from the Pennsylvania Department of Mines and Mineral Industries, but Mr. Hranica did not obtain a required solid waste permit. After signing the Consent Decree in 1973, William Hranica ceased operations in 1974. From 1974 to 1983, the site remained inactive; however, field assessment activities continued by U.S. EPA, PADER, PPG, ALCOA, and their contractors.

In April 1981, a field investigation of the site was performed by the FIT under contract to the U.S. EPA and concurrently by a PADER team. The investigation assessed the risk to nearby residents. Water samples taken during and subsequent to the field investigations indicated the possibility of ground water contamination in areas adjacent to the site. An assessment, including additional surface water, ground water, and stream sediment sampling, was conducted. Results of these studies, along with the recommendations for cleanup and disposal, were included in the FIT report (Appendix E).(4)

3.0 NATURE AND EXTENT OF PROBLEM

Since operation of the site began in 1966, U.S. EPA, PADER, and independent contractors hired by PPG and ALCOA have conducted several site investigations to determine the nature and extent of possible problems. Based on these investigations, remedial actions were taken by PPG and ALCOA in 1983 and 1984. These actions included removal of drums, tanks, and surface-contaminated materials. Precleanup site conditions and present site conditions are discussed below.

3.1 PRECLEANUP SITE CONDITION

Precleanup site investigations were conducted at the Hranica site by various contractors, including:

- o 1981, FIT by Ecology and Environment under contract with U.S. EPA and PADER, Contract No. 68-01-6056
- o 1982, PEC (a division of NUS), investigation conducted under contract with PPG (PEC Project No. 6110-03).

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The FIT team from Ecology and Environment and PADER visited the Hranica Land-fill in April 1981 for a site inspection. Their inspection report revealed that the site contained some 7,000 to 8,000 55-gallon drums [D'Appolonia removed 19,205 drums(6)], numerous burning vats, large storage tanks, and areas filled with a large number of five-gallon pails and filter cartridge wastes.(4) During the site inspection, numerous environmental samples were taken and analyzed. No samples were taken of the materials leaking from the drums or spilled on the soil. The drum count from the ravine rim was carried out in personnel safety protection Level D (no respiratory protection). The other investigations were carried out in Level B protection (supplied air for respiratory protection).

The FIT reported that (4) some of the area water supply wells and springs had been contaminated in the past with polychlorinated biphenyls (PCBs) and paint-related hydrocarbons. In addition, contamination had shown up in springs at two locations north and south of the site. Seeps discharged to both surface and ground water supplies; the surface waters affected are tributaries to McDowell Run and Little Bull Creek. Finally, the FIT also indicated that PCB-contaminated materials might have been present in large tanks.

Subsequent sampling confirmed that surface and ground water contained low levels of organic and inorganic contamination. The FIT also indicated the potential risk for nearby residents and suggested the need for immediate cleanup.

In 1982, at the direction of PPG, PEC personnel conducted a precleanup site investigation. The investigation included visits to the Hranica site and interviews with local residents. PEC also collected environmental samples, installed monitoring wells, and studied plant and wildlife around the site.

The PEC report indicated:(5)

- o Several containers were corroded or were open.
- o Machine excavation of drums would be needed and might cause container failures.
- o An estimated 40 percent of the drums would have to be overpacked.

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- o Wastes included atomized metal powder, coatings of various kinds, ceramic spheres, hardened waste resins, used refractory brick, and scrap steel.
- o Heavy construction equipment which had rusted considerably was also stored at the site. Large steel tanks on site contained hydraulic or cutting oils and other waste liquids.
- o Stored wastes in containers were in liquid, semisolid, and solid forms. Evidence of bulging of drum heads at the site presented a potentially dangerous situation.
- o Garbage and other wastes from the operation of the municipal landfill were mostly confined to the ravine area.
- o Samples of soils from well boreholes and stream bottoms, water from adjacent seeps, and ground water from monitoring wells collected at the dump site were analyzed by PEC to determine the identity, concentration, location, and migration of contaminants at the Hranica site. Results of the surface water seeps, shallow ground water, and soil testing indicated the presence of heavy metal (iron, mercury, and manganese), volatile organics (benzene, chlorinated solvents), and other organics (phenol, PCBs) to some extent.

3.2 POSTCLEANUP (PRESENT) SITE CONDITIONS

PPG and ALCOA jointly contracted D'Appolonia in 1983 to conduct an extensive site cleanup. The cleanup began in 1983 and ended in 1984 and consisted of removal of 19,205 drums, several tanks, pails, and about 4,000 cubic yards of visibly contaminated soil.(6) The materials were removed and shipped to secure landfills in New York. A postcleanup site assessment was conducted in 1984 by GCA under contract with U.S. EPA Region III. This site assessment reviewed the available data, including the site history, past disposal practices, the type of materials that were brought to the site, and the time periods of disposal. This report was never finalized by U.S. EPA. The GCA report indicates with the removal of containerized materials the contaminant sources at the site have been considerably reduced.

GCA stated in their report(9) that extensive surface cleanup (by D'Appolonia in 1983 and 1984) and other remedial actions by PPG and ALCOA have greatly improved the physical appearance of the site. There is minimal evidence of past

disposal practices with the exception of discarded automobiles at the south end of the site. Little or no chemical odor can be detected on site.(9) To further assess the effect of past disposal practices and cleanup activities on ground water and surface water quality, a monitoring program was initiated in June 1984 by PPG and ALCOA and was contracted to ESC.(8)

3.3 WASTE CHARACTERIZATION

3.3.1 Company Waste

During the period 1966 through 1974, the Hranica site was used for the disposal of industrial wastes generated by the PPG Springdale, Pennsylvania facility and the ALCOA facility at Logans Ferry, Pennsylvania. The PPG wastes consisted primarily of paints, coatings, resins, and solvents (Table 2.1). The ALCOA wastes were principally comprised of plating wastes, metal sludges, pastes, and powders (Table 2.1). During site cleanup, D'Appolonia (1983 and 1984) conducted extensive waste characterization on samples collected from drums, soils, large tanks, and ash piles that were present on the surface. This was required for waste disposal to landfills.

Based on the laboratory testing results, the wastes were categorized according to their physical states (i.e., liquid, solid, or sludge).(6) In addition, they were classified as organic or inorganic compounds and as acids, bases, oxidizers, and flammable compounds. A special-handling classification was given to materials which were water reactive and contained sulfides or cyanide. Wastes exhibiting high levels of organic halogens were separated and tested for PCB contamination.

The majority of the wastes stored at the Hranica site would have been classified as hazardous under Resource Conservation Recovery Act (RCRA) regulations if disposed of today. These wastes included:

- o PPG sludges, off-spec paints and resins which may have been ignitable and/or failed the Extraction Procedure (EP) toxicity test due to the presence of heavy metals
- o ALCOA aluminum paste wastes which may be reactive with water.

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3.3.2 Drum Analyses

A total of 14,736 drums were initially counted at the Hranica site by D'Appolonia personnel at each of 32 distinct areas of the site(4); however, the final drum removal count was 19,205.(6)

Sixty percent of the drums were identified as originating from PPG; nineteen percent had ALCOA markings. Seventeen percent were not labeled or badly deteriorated to make a positive determination; four percent were identified as originating from sources other than PPG or ALCOA.

Of the drums which contained wastes, more than 8,000 (42 percent) were full or partially full of solids and sludges (per RCRA definition). It was estimated that about 5 percent of the nonempty drums were full or partially full of liquids. Much of the liquid appeared to be rainwater that had collected in leaking and open-top drums. Some oil was also observed in drums.(6)

3.3.3 ALCOA Analyses

On August 19, 1981, ALCOA had several ALCOA waste samples from the Hranica site analyzed by their Analytical Chemistry Laboratory for RCRA hazardous waste characteristics.(10) The results are shown in Table 2.2.

ALCOA concluded that the leachate results for organics were inconclusive because the nature of the test itself probably "stripped" much of the volatile fraction from the sample. The heavy metal analysis in leachate from Sample No. 2 (Paste Area 4) contained a lead concentration of 0.54 milligram per liter (mg/l). This was the only heavy metal present above the detection limits in any of the leachates. This lead concentration is below the EP toxicity standard for lead under RCRA (5.0 mg/l). There was not enough sample to perform a series of flash point tests to assess ignitability of the waste.(10)

3.3.4 Ash Analyses

During site remediation, a large bank of ash (approximately 2,800 cubic yards) resulting from the burning activities by Hranica was found buried on the north side of the site.(6) D'Appolonia conducted a testing program to determine the chemical nature of the ash residue. The sampling and analytical program (Appendix F) for the ash residue was designed to determine:

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- o Total acid leachable heavy metal concentration in selected composites
- o Whether waste was hazardous due to heavy metal concentration in the leachate generated by the EP toxicity testing procedure
- o Characterization testing to determine the acid-base environment of the waste as an indicator for the potential leachability from rainfall.

The sampling technique involved establishing a baseline along the length of ash pile that was subsequently divided into six equal sections. Test pits were then excavated at the approximate centers of each of these six sections, providing a test pit spacing of approximately 50 feet (Figure 2-4, Appendix A). The collected samples from each test pit were placed in clean, plastic five-gallon pails, thereby forming a composite sample for each test pit location.

Total leachable heavy metal analysis was done using the American Society for Testing and Materials (ASTM) 1:4 acid leaching procedure (Appendix F). The EP toxicity analysis was performed on composite samples in accordance with the procedure developed by the U.S. EPA in the Code of Federal Regulations (CFR) Title 40 Part 261, Appendix B. The most probable weighted average concentrations of heavy metals were calculated (Appendix F) for extraction procedure leachate. Additional chemical parameters were determined in accordance with the methods given in Sobek, et al.(11), and Black, et al.(12), and include:

- o Reaction pH (1:1)
- o Potential acidity
- o Neutralization potential.

Tables 2.4 through 2.6 summarizes the analytical results for the six test pit ash composite samples. As indicated by these results, the leachate from the ash residue did not contain sufficient heavy metal concentrations for classification of this material as an EP toxic hazardous waste.(6)

Table 2.3 provides the results of the ash pile characterization testing.

These data indicate that the ash material exhibits an above neutral pH and has

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a neutralization potential greater than its potential acidity. When exposed to normal rainfall, the runoff or leachate generated would be expected to exhibit a relatively neutral pH, thereby limiting the solubility of heavy metals (with the exception of hexavalent chromium) in surface waters. The analyses show that there is little potential for leaching of heavy metals. Details of waste analyses and manifests of individual wastes are held in IT files at the Monroeville, Pennsylvania office.

Waste characterization conducted by ALCOA showed no heavy metals that would cause environmental problems.(10)

3.4 GEOLOGY AND HYDROGEOLOGY

Most of the geology and hydrogeology information presented in this section has been taken from the PEC report.(5) These data were collected by PEC during their field investigations.

3.4.1 Field Investigations by PEC

As reported by PEC, ten test borings were drilled to investigate subsurface conditions at the site.(5) Table 2.7 contains the test boring logs taken from the PEC report.(5) The test borings were completed using a mobile drill rig and four-inch-diameter solid-core augers. Grab samples of soils were taken whenever auger cuttings indicated a change in soil composition or resistance was noted in auger progression. All borings progressed to bedrock. Recovered samples were logged by PEC in the field by visual/manual inspection and bagged for further laboratory analyses.

The exploratory (test) borings completed by PEC were to provide baseline data on the local near-surface geology and preliminary information on ground water flow direction in the first aquifer.(5) Seeps from bedrock outcrops just below the soil cover along the valley south of the site and the orchard (Oak Tree seep), as well as at various locations and elevations within the site ravine, indicated a shallow ground water flow system at the bedrock-soil interface.(5) Based on this observation, PEC's initial investigation was limited to examination of soil, rock, and ground water conditions within the upper five to ten feet of bedrock.

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The PEC report(5) indicated that two (Monitoring Wells GW-1 and GW-5) of the four (Monitoring Wells GW-1, GW-4, GW-5, and GW-9) borings surrounding the outer slopes of the drainage divide were cored (NX, 3-1/2-inch-outside-diameter) five to ten feet into bedrock. A gray, medium-grained, micaceous sandstone was recovered in both borings. The sandstone was weathered to a yellow-brown color and broken, with prominent iron staining in open bedding planes and vertical fractures.

Third core (NX, 3-1/2-inch outside diameter) was taken in GW-4 location in the valley draining the site. Five feet of gray claystone bedrock was cored. Due to the extremely soft nature of both the soil and underlying claystone on the bench and in the valley, bedrock depths recorded in these areas were not as reliable as those on the ridgetop where sandstone bedrock caused auger refusal.

The soft nature of the shales and claystones underlying these borings and those lower in the valley made bedrock depth difficult to detect using auger refusal as the criterion. Augers will often continue into soft claystone without refusal, giving a false bedrock indication.(5)

During the 1982 site investigation, seven ground water observation wells (Monitoring Wells GW-1, GW-2, GW-3, GW-4, GW-5, GW-7, and GW-9) were installed by PEC into the corresponding test boring immediately after drilling. Typical well construction taken from the PEC report(5) is shown in Table 2.9 (Figure 2-1, Appendix A).(5) All wells were constructed of threaded sections of two-inch, Schedule 80 polyvinyl chloride (PVC) pipe with the bottom three to five feet manually slotted and covered with a fiberglass screen. A quartz sand pack was added around and at least one or two feet above the screen and the monitoring interval and segregated by a liberal amount of bentonite added to the annulus above the sand pack. The borings were then grouted to the surface. Protective, locking steel casings were grouted around each of the four wells located on the hill to prevent vandalism.(5)

3.4.2 Site Geology

The disposal site is located in the west-central part of the Allegheny Plateau Physiographic Province and is underlain by sedimentary rocks of Pennsylvanian

Age. These rocks have since been breached and Quaternary sediments mantle the eroded valleys.(5)

Bedrock at the top of the ridge at the drainage divide consists of medium-grained sandstone. Lower in the valley, bedrock consists of soft gray and brown to reddish-brown shales and claystones. Regionally, bedrock strikes northeast to southwest and dips northwest at approximately 0.87 degrees. Structure contours on the Upper Freeport Coal Seam, some 400 feet beneath the site (Figure 2-2, Appendix A), indicate that the axis of the southwest-plunging McMurray Syncline lies one-quarter to one-half mile northwest of the disposal site.(5)

Data collected by PEC from the ten exploratory borings, in combination with available regional stratigraphic information (Figure 2-3, Appendix A), indicate that the sandstone underlying the soils in the upper portions of the site is probably the bottom of the Morgantown Sandstone Member. As shown in Figure 2-3 (Appendix A), the Morgantown Sandstone occurs in the lower half of the Casselman Formation, Conemaugh Group (Table 2.8). At the site, this sandstone forms a "caprock" above softer claystone and shale units. The bottom elevation of the sandstone unit, based on the bench borings and seeps, is at approximate Elevations 1200 and 1210 feet. The gray and red shales and claystones recovered at Monitoring Wells GW-3, GW-4, GW-6, and GW-7 on the bench and valley therefore belong to the Birmingham Shale Member (Casselman Formation, Conemaugh Group).(5)

The Birmingham Shale generally consists of approximately 85 feet of variegated to red, sandy shales with marine fossils and brown shales. These are separated from interbedded reddish and gray shales, locally called "Pittsburgh Red Beds," by the greenish-gray Ames Limestone Member. The Ames Limestone Member separates the Casselman Formation from the Glenshaw Formation, of which it is a member (Figure 2.3, Appendix A).(5)

The quality of the photos used in the analysis and the surficial disturbance at the site made analysis difficult (Figure 3.1; Appendix A). However, a preliminary fracture trace analysis was conducted for the site by Dr. Appelon in 1984 (Appendix G). The analysis suggested that at least two fracture sets cross the study area from north-northwest and northeast.

3.4.3 Site Soil

The PEC report indicates that the soils above the fractured sandstone bedrock in Monitoring Wells GW-1, GW-2, GW-5, and GW-9 are residual; that is, derived from the bedrock. The soils are composed of brown to orange-brown silt with high percentages of sand (20 to 50 percent) with lesser amounts of clay and no rock fragments. These soils are normally very permeable and well-drained and are sufficiently fractured to allow rapid infiltration of rainwater. Soil thickness in the drill holes ranges from 10 (Monitoring Well GW-1) to 14 (Monitoring Well GW-9) feet, averaging 11.8 feet.

The PEC report indicates that the soils in Monitoring Wells GW-6 and GW-8 on the bench are predominantly brown, red, and gray with lesser sand percentages than noted for soils on the ridge above and contain clay and rock fragments. Soil in Monitoring Well GW-7, also on the bench, more closely resembles that of Monitoring Wells GW-1, GW-2, GW-5, and GW-9, being predominantly sandy in composition. In all three of the borings on the bench, sanitary refuse and mild to strong sanitary and chemical odors were associated with the soil above bedrock.(5) The difference in soil composition between Monitoring Wells GW-6, GW-7, and GW-8 may be the result of different cover sources during and after the sanitary fill stage of this portion of the site.(5) Soil and refuse depth over bedrock is 10.5, 13, and 7 feet in Monitoring Wells GW-6, GW-7, and GW-8, respectively.

3.4.4 Site Hydrogeology

Limited information is available concerning the rate, direction, and controls on the ground water flow systems in the vicinity of the Hranica site. Two perched aquifers were delineated by the exploratory program. Field observations indicated that the first unit aquifer(5) is associated with the Morgantown Sandstone and overlying unconsolidated materials on the erosional bedrock. The second aquifer is believed to occur in the Ames Limestone. The Morgantown Sandstone and Ames Limestone aquifers are separated at the site by the Birmingham Shale.(5) The PEC report indicates that both aquifers are breached by drainages which act as discharge zones.

The Morgantown Sandstone aquifer occurs within the highly weathered, broken sandstone capping the drainage divide of the site and the unconsolidated

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surficial materials below the sandstone cropline. The aquifer is unconfined and perched on the underlying, less-permeable Birmingham Shale Member as evidenced by the presence of springs and seeps at the approximate bottom elevation of the Morgantown Sandstone. This aquifer is of limited areal extent occurring only on ridgetops and slopes and is therefore not considered an important aquifer in the area.(5)

Infiltration through the sandy soils and fractured bedrock results in recharge to the Morgantown Sandstone aquifer. Ground water flow in this aquifer is controlled by the depth of the Birmingham Shale, with localized "radial" flow due to geomorphic influences such as the line sinks created by local valleys which breach the aquifer. The Oak Tree seep probably results from direct discharge from the Morgantown Sandstone aquifer.(5) Observation wells established in this aquifer included Monitoring Wells GW-3, GW-4, and GW-7. The well screening details for monitoring wells are incorporated in cross section drawings (Appendix J, Drawing No. 165-03-R1) and the ground water monitoring well construction details (Table 2.9).

The PEC report indicates that the three borings penetrated eight to ten feet of refuse, soil, and wastes and had strong chemical and/or sanitary odor before reaching the top of bedrock in the sanitary landfill area.(5) Monitoring Well GW-7 is an indicator of contaminant concentrations in the landfill; however, this well is screened in the bottom of landfill in the leachate collection zone.

Precleanup site monitoring data for chemicals in Monitoring Well GW-7 indicated that contamination could result from infiltration of surface water through the wastes stored in the sanitary landfill, direct leakage from barrel wastes, and/or discharge from the Morgantown Sandstone aquifer at the approximate elevation of the bench (Cross-Sections A-A' and B-B', Drawing 165-03-R1). Chemical analyses by PEC of these three first aquifer wells (GW-3, GW-4, and GW-7) indicate that phenol, iron, and total organic carbon concentrations decrease downgradient (Monitoring Wells GW-3 and GW-4). The improved water quality is possibly due to removal of the waste source, higher-quality water flowing in the unconsolidated materials, and soil attenuation of any contaminants.

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PEC precleanup data show that the concentrations of sulfates and chlorides increase downgradient of Monitoring Well GW-7, while sodium, magnesium, and total dissolved solids values increase to Monitoring Well GW-4 and decrease to Monitoring Wells GW-3 from GW-7.

Elevations of springs downgradient in the valley, as well as springs serving the Obringer farm, emanate from land surface elevations between 1,110 and 1,115 feet and are potential outlets for water from within the Ames Limestone.(5) Little information is available about this unit. It is probably of limited areal extent and perched on the Pittsburgh Red Beds.

In summary, perched ground water is present in the sandstone and limestone units located on the ridge above the Little Bull Creek valley. Discharge from these units flows out radially at the contacts with underlying units. Ground water may also discharge vertically along fractures in the bedrock. No information is available about the deeper regional ground water flow systems. The intercommunication between the local perched and regional ground water flow systems and the regional ground water flow directions has not been established.

3.5 CONTAMINANT ASSESSMENT

This section includes the review of data collected by different organizations/agencies during site investigations and sampling results. The various data sources include:

- o FIT 1981 report
- o PEC 1982 report
- o PADER (1980 to 1985)
- o D'Appolonia (1983) split sampling data
- o GCA 1984 report
- o ESC 1984 to 1986 water quality sampling data.

The FIT investigation was geared towards site assessment; however, environmental samples, including surface/seep and ground water samples, were collected and analyzed (Appendix E).

PEC investigations(5) provided the most environmental sampling and data. The program included:

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- o Three sediment samples from surface drainage bottoms (S1-S3; Table 2-12)
- o Six soil samples from test borings (S4-S9; Table 2.12)
- o Surface water samples from nearby seeps and streams (Table 2.10 and 2.11)
- o Ground water samples on and around site monitoring wells.

D'Appolonia, PADER, and ESC sampling programs were limited to split samples from surface water/seeps and ground water. The contaminant assessment based on review of these data is briefly presented below.

3.5.1 Precleanup Ground Water (Pre-1984)

Limited ground water data are available in the FIT report.(4) PEC ground water sampling locations are shown in Table 2.11 (Figure 2-5, Appendix A) and results are presented in Table 2.14 and summarized in Table 2.26. PADER 1981 and 1983 sampling data are also included in the table. Major contaminants found by PEC in Monitoring Well GW-7 were benzene [2 parts per billion (ppb)], several chlorinated solvents (1 to 2 ppb), phenols (220 ppb), and naphthalene (400 ppb). Trace concentrations of pesticides (0.08 to 0.34 ppb) were also found in the Monitoring Well GW-7 sample.

Review of PADER files indicates that the agency was involved in several split sampling programs on the site from 1980 through 1985. The results of their precleanup split samples for 1981 and 1983 are included in Tables 2.15 through 2.22, summarized in Table 2.26., and briefly discussed here.

Precleanup site data by PADER for the April 1981 data review indicated that no inorganic contaminants were detected in ground water samples.

PADER data for samples collected in September 1983 were analyzed for limited parameters in selected samples. Heavy metals in ground water samples were low compared to Monitoring Well GW-7 which was found to contain higher concentrations of lead, chromium, manganese, iron, and nickel. Monitoring Well GW-7 was found to contain ethylbenzene (3,500 ppb), benzene (7.9 ppb) and toluene (2.4 ppb). Low concentrations of volatile organics (10 ppb ethylbenzene, 14 ppb benzene, and 42 ppb toluene) were found in Monitoring Well GW-3.

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Results of the split samples collected at various locations by IT in September 1983 (Figure 2-5, Appendix A) are presented in Tables 2.15, and 2.21 through 2.23 and summarized in Table 2.26. The metal concentrations in Monitoring Wells GW-3 and GW-7 showed higher concentrations of lead and nickel. Monitoring Well GW-7 was found to contain higher concentrations of ethylbenzene (15,700 ppb), benzene (5,700 ppb), methylene chloride (13,100 ppb), tetrachloroethylene (21,400 ppb), toluene (24,700 ppb), and naphthalene (45 ppb). Trace quantities of volatiles (3.4 to 11 ppb) were found in Monitoring Well GW-3. Organics were not found in any of the surface waters tested.

3.5.2 Soil and Sediment

The analytical data presented in Table 2.12 have been taken from the 1982 PEC report and include those of the U.S. EPA - FIT and PADER investigators. Analysis of leachate soil/sediment by PEC using the EP toxicity procedure and surface water samples showed the presence of several contaminants. Both inorganic materials and organic constituents were found in one or more samples. Low mercury concentrations were found in sediment of the stream draining the orchard south of the waste site. Contaminants and suspected migration pathways found from the PEC sampling program are shown in Drawing 165-03-S1.

3.5.3 Surface Water and Seeps

There are no streams running through the Hranica site; therefore, the only source of water at the site is rainfall. Precipitation runs across the landfill; however, the recharge data for the landfill is not known. The seeps present around the site is probably the result of direct discharge from Morgantown aquifers.

3.5.3.1 Precleanup Assessment

Initial surface water/seep samples were collected by FIT (1981) and presented in their report.(4) The data is included in Appendix E. The Obringer Farm spring and tributary to McDowell Run downstream to Hranica were found to contain low levels of contaminants.

Tables 2.13, 2.21, and 2.23 and summary Table 2.24 contain chemistry data for the surface water locations (Figure 2-5, Appendix A) for PEC, D'Appolonia, AR300027

PADER, and ESC. According to the PEC report, precleanup contamination assessment showed surface waters to be contaminated with trichloroethylene (35 ppb), phenols (0.79 ppm), PCB (1 ppb), iron (115 ppm), manganese (2.7 ppm, and mercury (0.033 ppm), respectively.

3.5.3.2 Postcleanup Assessment

Postcleanup surface water and seep data are included in Tables 2.15, 2.16, 2.17, 2.19 through 2.21, 2.23, and are summarized in Table 2.25. Data collected by PADER and ESC are reported sequentially in this section.

PADER postcleanup sampling data for June 1984 showed surface waters to contain higher concentrations of iron and manganese in surface water at the Obringer springhouse (Table 2.17) and Oak Tree seep (Table 2.20). Volatile organic analyses showed low concentrations of organic solvents in Oak Tree samples (Table 2.20). PADER samples data for April 1985, for Obringer springhouse and Oak Tree seeps, were analyzed for selected parameters, including volatile organics. Inorganic and metal concentrations for surface water and seeps did not reveal significantly elevated levels.

The ESC monitoring program shows that the pH for all surface water locations was near neutral, the same as the ground water samples. Specific conductance for surface waters was lower than ground water, indicating a lower concentration of dissolved ionic species. For surface locations, the Oak Tree seep (Table 2.20) sampled in June 1984 was high in specific conductance. Metal concentrations of surface waters generally exhibited trends similar to those in ground water; however, selenium was found higher in the June and October 1984 samplings at selected locations. Chromium was low for all surface water samples except July 1985 at Spring SW-H (Table 2.2.1; Figure 3.2) located downgradient of the landfill. Cadmium concentrations were higher in January 1985 and during April 1985 at the Cornfield (Table 2.19) and the Oak Tree seeps (Table 2.20).

ESC data showed total organic carbon concentrations for all the surface locations tested were all relatively low (26 mg/l or less). Total organic halogen values were less than 0.1 mg/l with the exception of the Oak Tree seep

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in June 1984 (0.96 mg/l) and Spring SW-H in January 1985 (0.13 mg/l). (Table 2.21) Phenolics were not detected in any of the surface locations in 1985. The Oak Tree seep in June 1984 showed 0.67 mg/l of phenol (Table 2.20). Trace quantities of chlorinated organics were detected in July 1986 in these samples.

According to the ESC data, certain volatile organics were elevated in concentration in the Oak Tree seep. The July 1985 sample indicated the presence of methylene chloride at 220 ppb (Table 2.20). (This was probably due to laboratory contamination; methylene chloride was also detected in method blank samples.) Ethylbenzene was present at a concentration of 55 ppb. Other volatiles detected in low concentrations (less than 12 ppb) in the Oak Tree seep were benzene and trans-dichloroethylene (Table 2.20).

Samples taken by ESC from the Cornfield seep contained methylene chloride (180 ppb) and benzene in July 1985 (methylene chloride was found in the method blank for July 1985 samples). Samples from this location on other dates were free or contained low concentrations of organics. Trace quantities of benzene, and methylene chloride (16 ppb) were also detected in Spring SW-H (Table 2.21) in 1985 samples.

The Obringer springhouse is located northwest of the landfill along a down-gradient migration pathway.(7) ESC chemistry data for the Obringer springhouse showed methylene chloride (3 ppb) in June 1984 along with concentrations of phenolics (0.30 ppm) (Table 2.17). Metal concentrations of selenium were slightly higher in the June and October 1984 samples and concentrations of mercury were slightly higher in October 1984 samples. Iron and manganese were also found during periods of 1985 (Table 2.17).

A new landfill, the Varos Landfill, has been located on the east side of the Hranica Landfill; therefore, the Varos Landfill tributary, a surface drainage stream from the new landfill, was included in the ESC (1984) sampling program. This tributary is not affected by any surface drainage from the Hranica Landfill. Other sampling locations included in ESC program included Obringer water supply and Little Bull Creek. The Obringer water supply is a second spring at the Obringer farm that was used to replace the springhouse source. Little Bull Creek is the receiving stream for the regional drainage

basin. Sampling locations on Little Bull Creek included locations which were believed to be upstream and downstream of suspected influence by the Hranica Landfill. Table 2.23 presents data for these samples. Metal concentrations were generally low for surface water samples, except the selenium (0.03 mg/l) and mercury (0.003 mg/l) (Table 2.23) at the Varos Landfill tributary, which is independent of the drainage from the Hranica site. Water quality of Little Bull Run was essentially the same upstream and downstream of the Hranica Landfill (Table 2.23). No volatile organics were detected in any of the surface water samples and total organic carbon values were all less than 10 mg/l.

In a technical assessment, GCA(9) cites that the PEC report(5) appears to adequately describe sources of contamination at the Hranica site. The contaminants have since been removed so the sources at the site have been considerably reduced, thus reducing the potential for contaminant migration. The capping and grading of the site has significantly reduced the transport of chemicals via air, on-site runoff, or biotic mechanisms. Ground water presently seems to be the major potential pathway for contaminant migration.

GCA indicated that the PEC report fully identified the ground water discharges around the site. The June 1984 sample results of off-site surface water showed the presence of chlorinated hydrocarbons in the unnamed tributary behind the Joseph Hranica residence. The Oak Tree seep showed chlorinated and aromatic volatile organics in the discharge in June 1984. The quarterly sampling and monitoring of ground water and surface seepage currently being conducted by PPG is adequate to monitor the contaminant migration off site.

Among the surface water and seeps, the Oak Tree and Cornfield seeps were found to be contaminated with volatile organics. The Obringer spring had shown significant reduction in chemical concentration. No contaminants were found in Little Bull Creek in recent sampling (July 24, 1986).

3.5.4 Air

This section describes precleanup air quality at the site. Between the 1960s and 1970s, waste burned at the Hranica site released constituents to the air that may have included combustion particulates, uncombusted volatile materials, and organic compounds. In 1974, when the site became inactive, the

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disposal procedures causing these major sources of air contamination stopped. However, the drums of wastes were exposed to environmental changes, including temperature and humidity.(4) At high temperatures, pressure in drums containing volatile solvents greatly increases, as evidenced by some bulging drums, and gradual polymerization of wastes occurs. Because of the changes in the wastes over time, some of the wastes still in drums may be less volatile than when they were first generated; however, volatile materials remained in drums between 1966 to 1984 at the site.(5)

FIT reported(4) an organic vapor concentration of 60 to 80 ppm in their April 1981 site inspection report. The measurement of hydrocarbon concentration in the air was made with a portable organic vapor analyzer (OVA). PPG conducted similar measurements in October 1981 and their measurements did not show any concentrations greater than the normal background of 5 to 10 ppm except immediately above the surface of liquids seeping from leaking drums.(13) A concentration of 15 to 20 ppm was noted in the breathing zone immediately above the spill at the site where a drum had apparently been accidentally overturned and spilled during a PADER visit to the site on the previous day.(13) This measured concentration was well below the threshold limit value (TLV) for the mineral spirits, toluene and xylene which were inferred from the odor to be the major solvents involved. The odor which is present at the site was identified as the odor of oxidized oleo-resins and not volatile organic solvents.(13)

After 1974, Mr. Hranica continued minor burning of waste solvents for heating purposes, creating continuing air releases of combustion products. Rusted leaking drums contributed to additional releases of volatile organics. The sludge or other solid material remaining inside the drum became increasingly accessible to leaching by rainwater. The process released the volatile materials to the air quickly, while the leaching of the solid residues occurs slowly. Dust releases were not a significant factor in air pollution at the site.

Extensive air emission measurement of volatile organics was made by D'Appolonia during the removal and surface cleanup at the site. This was done to monitor air quality around the site to protect the health of nearby resi-
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dents and D'Appolonia employees involved in the cleanup. Occasionally high concentrations of volatile organics (approximately 1,000 ppm) were encountered at work areas, though the perimeter concentrations for volatile organics did not exceed the background concentrations (less than 1 ppm).(6)

There are no containerized wastes on site and the apparent sources for volatile organics have been removed. During a site visit by IT personnel on September 12, 1986, odors related to chemicals were not detected.

4.0 HISTORY OF RESPONSE ACTIONS

In the fall of 1982, PPG and ALCOA proposed a complete surface cleanup of the site. D'Appolonia prepared a technical proposal (Appendix B), Preparedness Prevention and Contingency Plan (Appendix C), and Laboratory Analysis Protocol (Appendix D). In early 1983, the proposed work was approved by PADER, which assured the companies that PADER was the lead regulatory agency and that the U.S. EPA was being kept fully informed of all developments.

The actual site work was begun in the summer of 1983 by D'Appolonia and involved the removal of a large volume of contaminated soil, thousands of drums, pails, liquid hazardous waste, and PCB-contaminated liquids found in the tanks at the site. The tanks were decontaminated and the decontamination fluids were incinerated or treated off site. The work was completed in 1984.

Work at Hranica was done in four phases: site investigations, site cleanup, site closure, and ground and surface water monitoring.

4.1 PHASE I - SITE INVESTIGATION

PPG hired PEC in 1982 to conduct preliminary site investigations at the Hranica site. The report of the investigations was submitted to PPG and consisted of a site contamination assessment that involved collection of geological, hydrological, data and installation of monitoring wells, and collection of surface/subsurface water samples. PEC conducted waste assessment studies and recommended various remedial plans that included on-site treatment, on-site containment or off-site disposal operations.(5)

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4.2 PHASE II - SITE CLEANUP

D'Appolonia was contracted jointly by PPG and ALCOA to complete this phase. The site cleanup phase included segregation, characterization, removal, transportation, and disposal of drummed waste materials from various locations (Figure 2-6, Appendix A) and contaminated soil. The phase was begun in July 1983 and was completed by November 1983, except for disposal of the PCB-contaminated liquids which was done in May 1984(6) (Appendix G).

4.2.1 Surface Cleanup

Surface cleanup involved removal of drums, tanks, pails, and other visibly contaminated materials. Samples from each accessible drum were collected and those characterized as RCRA hazardous waste were disposed of off site. A total of 19,205 drums were removed; approximately 25 percent of these were ALCOA drums.(6) Leaking drums were overpacked in salvage drums. The wastes were manifested and shipped to the SCA, Model City disposal facility in New York for disposal under U.S. EPA I.D. No. NYD-049836679; Department of Transportation shipping name--hazardous waste N.O.S. (not otherwise specified) (paint sludge, solvents; off-spec paint, aluminum paste, and crushed drums).(6)

Three tanks containing oils and paint sludges were emptied and decontaminated on May 11 through 16, 1984. The PCB-contaminated wastes were incinerated at the SCA disposal facility in Chicago.

The tank decontamination procedures which were conducted subsequent to sludge and waste removal were as follows:(Appendix G)

- o Any excess sludge which was present was scraped from the tank sides and pumped into a vacuum tank truck.
- o A high-pressure spray using diesel fuel was utilized to clean the sidewalls of each tank. This wash solution was then pumped into the tank truck.
- o The scraping and high-pressure wash techniques were then repeated.
- o Two wipe samples were taken from each tank.
- o Tanks Nos. 3 and 5 were turned upside down in place and dirt was placed around the tanks to prevent access to the inside of the tanks. The tank cover was bolted to the top tank opening.

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The wipe samples were analyzed by the IT Pittsburgh Laboratory for PCB contamination. The test results indicate that a substantial reduction of PCB contamination was attained (Table 3.1).(6)

4.2.2 Subsurface Cleanup

During the latter stages of the surface cleanup, it was found that some surface ash deposits existed beneath the ground surface. Exploratory trenches were dug to evaluate the extent of these deposits. In addition to substantial quantities of buried ash, subsurface deposits of paint filters, paint sample cans, some drums, and bulk deposits of partially solidified gelled resins were found.(6) PPG had these buried wastes removed and disposed in a secure landfill (Model City, New York). The remediation work involved excavation and disposal of over 4,000 cubic yards of contaminated soil. Contaminated soil was identified by visual inspection.(6) This methodology was possible because the waste types were highly visible: pigments, aluminum powder and pastes, paints, resins, and ash residue containing inorganic pigments. Visual detection of contaminated soil is standard practice when the contaminant itself is pigmented. PPG had used this procedure for other cleanups approved by numerous state agencies. This procedure was required at Hranica by PADER before the cleanup work began. The PPG and ALCOA surface and soil cleanup was approved as complete by PADER in a meeting on January 26, 1984 attended by Chuck Duritsa (Pittsburgh) and Russ Crawford (Meadville) of PADER.

4.2.3 Ash Pile

A large surface deposit of approximately 2,800 cubic yards of ash was found on the southwest corner of the site. Samples were taken from this ash pile and analyzed by D'Appolonia and analysis reports were submitted to PADER. EP toxicity analysis indicated the ash was not EP toxic (Tables 2.3 through 2.6). PADER conditionally approved capping of the ash and leaving it on site.

4.3 PHASE III - SITE CLOSURE

Two site conditions dictated the need for site closure work. The first was the ash pile resulting from Hranica's burning activities. Negotiations with PADER led to a PPG and ALCOA agreement to secure the ash pile on site. AR300034
June 1984, under contract by ALCOA and PPG, D'Appolonia placed two feet of

local clayey soil over the pile and graded the soil to allow for proper drainage, characteristics of the soil material used as clay cover ^{are} ~~is~~ described in Table 4.1 and were excavated from borrow pits TP-7 and TP-8. Second, the Phase I waste and soil removal activities disturbed the site terrain and vegetation such that water ponding and soil erosion would be encouraged if the site was left "as is." A general contractor was engaged and the site was graded and filled in to allow for proper drainage and vegetation growth. D'Appolonia, as part of their ash pile work contract, hydroseeded the entire site to stabilize the soil.

4.4 PHASE IV - GROUND WATER MONITORING

IT has reviewed the available hydrogeologic information for the area including the well logs for existing monitoring wells which were installed by PEC prior to site cleanup and the location of these wells on the site. The ground water monitoring data was collected in 1982 by PEC and between 1980 to 1985 by PADER and 1983 during a split sampling program. The data review has been divided into two sections to understand the water quality prior to site cleanup and after site cleanup. The precleanup data includes PEC, PADER, and D'Appolonia data. Postcleanup data includes ESC quarterly ground water monitoring data that started in 1984 and still continues. The precleanup ground water is discussed in Section 3.5.1. The postcleanup data is discussed here.

Postcleanup sampling data are included here and in Tables 2.15, 2.18, and 2.22, and are summarized in Table 2.27. June 1984 PADER sampling dates showed higher concentrations of iron and manganese concentrations in Monitoring Wells GW-3, GW-4, and GW-7. Trace quantities of phenols (125 ppb) were found in Monitoring Well GW-7 along with trace quantities of volatile organics in Monitoring Wells GW-3 and GW-4. Monitoring Well GW-7 was also found to contain ethylbenzene (9,000 ppb) along with trace quantities of other volatiles. In the October 1984 sampling by PADER showed higher arsenic, chromium, and lead in Monitoring Well GW-7, along with ethylbenzene (4,230 ppb), xylene (6,500 ppb), dimethylphenol (60 ppb), and naphthalene (120 ppb).

During subsequent sampling in January and June of 1985, PADER found trace quantities of chlorinated organics in Monitoring Wells GW-3 and GW-4. In January Monitoring Well GW-7 was found to contain higher concentrations of

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ethylbenzene (1,700 ppb), xylene (8,900 ppb), naphthalene (100 ppb), and methyl phenol (90 ppb). April 1985 PADER samples showed ethylbenzene (8,400 ppb), xylene (3,000 ppb), and naphthalene (150 ppb).

Inorganic constituents iron and manganese found at higher concentrations were in the range commonly found in leachate from mined areas.

ESC, hired by PPG, is conducting the quarterly monitoring of ground water, surface water, and seeps since the remediation in 1984. They have also conducted split sampling programs with split samples to PADER. These data are also included in Tables 2.15, 2.18, and 2.22.

Postcleanup ESC data collected from 1984 to 1986 (Figure 2-5, Appendix A) and summarized in Table 2.27 show the locations and the chemistry data for ground water monitoring in Monitoring Wells GW-3, GW-4, and GW-7 and the surface water samples.(8) ESC indicated that no samples were obtained from Monitoring Wells GW-1, GW-2, GW-5, and GW-9. Monitoring Wells GW-1, GW-5, and GW-9 were dry on all dates when measurements were made and Monitoring Well GW-2 contained insufficient water for sampling.

The pH for the three wells sampled was near neutral, ranging from 6 to 7. Specific conductance ranged from 490 micromhos per centimeter at 25 degrees Celsius in Monitoring Well GW-3 to a high of 950 micromhos per centimeter at 25 degrees Celsius in Monitoring Well GW-7 (Table 2.22).

Five quarters of data show that the levels of six metals (arsenic, chromium, mercury, silver, copper, and zinc) were low in all the wells. Low selenium concentrations were found in the June and October 1984 sampling for all wells but were below detection in all subsequent samplings. Cadmium concentrations in all wells were high. Lead concentrations were lower in Monitoring Wells GW-3 and GW-4 than at Monitoring Well GW-7 (Tables 2.15, 2.18, and 2.22). Iron and manganese were generally high with the highest concentration detected in Monitoring Well GW-7 (Table 2.27).

Monitoring Well GW-7 was found to contain the higher concentrations of chemicals. This is possibly due to the screening of this well at the bottom of landfill in the leachate collection zone.

In the 1984 sampling of monitoring wells, organic analyses showed the highest concentration of volatile contaminants in Monitoring Well GW-7. Xylene concentrations ranged from >2,000 to 19,300 ppb. Ethylbenzene was present in concentrations ranging from nondetectable to 5,500 ppb. Other volatile constituents found in Monitoring Well GW-7 during the 1984 monitoring period were below 11 ppb (Table 2.22).

Trace concentrations of volatile organics were found in Monitoring Wells GW-3 and GW-4 in 1984. The wells are located topographically downgradient of Monitoring Well GW-7 which contained methylene chloride, trichloroethylene, and trans-dichloroethylene as found in the June 1984 and July 1985 samplings.

Base-neutral and acid extractables for Monitoring Well GW-3 for the samples collected on January 17, 1985 were undetected (below detection limit).

Total organic carbon for Monitoring Well GW-7 ranged from 18 to 28 mg/l and was below 10 mg/l for Monitoring Wells GW-3 and GW-4. However, 40 to 47 mg/l occurred in both wells in April 1985. Total organic halogen values were highest for Monitoring Well GW-7 (0.17 to 0.92 mg/l) followed by Monitoring Wells GW-3 and GW-4 (nondetectable to 0.020 mg/l and nondetectable to 0.170 mg/l, respectively).

Phenolics were not detected in Monitoring Wells GW-3 and GW-4 except in the June 1984 sampling. Phenolics were present in Monitoring Well GW-7 during all sampling periods except July 1985. When present, concentrations ranged from less than 0.01 to 0.63 mg/l. Data from 1985 ESC consistently showed manganese, phenolics, and ethyl benzene in GW-7 samples.

Recent sampling data (July 24, 1986) showed only Monitoring Well GW-7 with higher concentrations of iron (34 mg/l), manganese (5.4 mg/l), and ethylbenzene and total xylenes (1,800 ppb and 840 ppb, respectively).

Quarterly monitoring data by ESC showed significant reduction in surface and seep concentrations of metals and organics; however, Monitoring Well GW-7 was contaminated with metals and volatile organics. Monitoring Wells GW-3 and GW-4 showed trace concentrations of organic contaminants.

In summary, presite cleanup and ground water samples were contaminated with heavy metals and organics. Recent samples show significant reduction in chemical contamination.

5.0 SITE VISIT

On September 12, 1986, IT personnel visited the Hranica site to evaluate the present site conditions. The objective of the site visit was to become familiar with the topography, water migration pathways, recharge and discharge zones, seeps, and gullies that may potentially lead to the off-site migration of any remaining contaminants.

IT found several junked cars and trucks on either side of Hranica Drive. Rusted heavy construction equipment was also located on the southeast corner of the landfill. The clay cap was in place, although signs of erosion were visible. The surface of the clay cap showed dense perennial vegetative growth.

IT personnel proceeded along the orchard fence line to locate the ground water monitoring wells and the Oak Tree seep. Monitoring Wells GW-2 and GW-5 were located on the western edge of the orchard and found to be dry. The Oak Tree seep had limited flow; however, a drainage stream further downstream approximately 90 feet below from the landfill was observed. It collected water from the orchard and possibly from the Hranica site. This suggested that Monitoring Wells GW-2 and GW-5 were not completed to a sufficient depth to intercept the ground water from the landfill. Another surface drainage stream was observed southwest of the site which could possibly be receiving ground water discharge from the landfill. IT's attempts to locate Monitoring Well GW-7 and other wells were unsuccessful due to dense vegetation growth.

Surface water and seep sampling points were also located during the site visit. These locations included Little Bull Creek, the Obringer property, and the tributary along the Varos Landfill.

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6.0 DEFINITION OF BOUNDARY CONDITIONS

A precleanup study report of the site was issued in July 1982 by PEC under contract with PPG.(5) The document contains a description of the site, the site background, and a description of the threatened releases from the stored material.

The site includes a discrete 15-acre parcel that was defined by William Hranica's property line (Figure 2-6, Appendix A) as well as aerial photographs of drum storage areas and the topography itself. The site extends about 100 feet east of the property boundary at the locations shown in Figure 2-6. Boundaries to the site were marked by flagged ropes. The PEC studies and a later survey were the bases for the established site boundary which encompassed the waste storage and disposal.

During surface cleanup of the site in 1983, D'Appolonia prepared a site map indicating boundary conditions and the location of PPG and ALCOA drummed waste (Figure 2-6, Appendix A). The site was surveyed and sectioned according to the waste location and the physical/chemical description of the waste. Since cleanup of the site in 1984, the boundary conditions on site have significantly improved. A clay cap over the ash piles and the municipal landfill remains on place. During a recent visit, PPG found that additional junk cars and trucks are being brought on site by Mr. Hranica.(14) This is a potential cause of concern to PPG as the clay liner is being damaged. This may result in infiltration of precipitation through the clay liner with subsequent contaminant migration. In addition, the stored vehicles may result in migration of gasoline and oil spilled from this equipment and result in eventual environmental pollution. PPG has informed PADER and U.S. EPA of these concerns.(14)

7.0 SUMMARY

This report compiles and summarizes environmental data concerning the Hranica waste disposal site located in Buffalo Township, Butler County, Pennsylvania. The data is drawn from the files of PADER, U.S. EPA Region III, PPG, ALCOA, and IT.

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The topography of the site is typical of the hilly Allegheny Plateau in the Western part of Pennsylvania. The site itself occupies part of a ^{horseshoe-}household-shaped ridge with the open end, facing ^{east}~~each~~-northeast, forming a relatively open ravine.

The geology of the site is typical of the Allegheny Plateau. This area is underlined by sandstone, shale, and limestone of the Connemaugh formation. The uppermost water-bearing zone is within the Morgantown sandstone and the unconsolidated material overlying it. A deeper water-bearing zone is in the Ames limestone. Both zones are breached by the valley running northeast from the site. The zones are largely recharged by surface water infiltration.

In 1982, PPG hired PEC (a division of NUS) to perform a precleanup site investigation. PEC performed a surface survey which indicated numerous drums, many of which were in a corroded or bulging condition. Garbage and other wastes from operation of a municipal landfill were mostly confined to a bench below the hilltop in the ravine area. The following wastes were assumed to have been handled at the site:

- PPG

Off-spec paints, coatings, and resins, paint and resin sludges, waste solvents, obsolete raw materials, filter and scrubber waste, caustic solutions, isocyanate and waste oils.

- ALCOA

Plating wastes, metal sludges, waste oils, waste hydrofluoric acid, scrap metal, pastes, and powders, filter scrubber and baghouse wastes.

- Other

Household refuse, municipal and industrial waste.

As indicated in the PEC report, the disposal practices resulted in the presence of organic solvents in the ground water and seep samples at various locations around the site. Contaminants were not consistently detected in any one location during precleanup sampling.

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TABLE 2.1
WASTE MATERIALS
POSSIBLY PLACED AT THE HRANICA SITE

INDUSTRY NAME AND CLASSIFICATION	LOCATION	DURATION OF DISPOSAL AT SITE	WASTES
1. PPG Coatings and Resins	Springdale, PA	1966-1973	Off-spec paints, coatings and resins, paint and resin sludges, waste solvents, obsolete raw materials, filter and scrubber waste, caustic solutions, isocyanates and waste oils
2. ALCOA Metals Manufacturing	Logans Ferry, PA	1968-1974	Plating wastes, metal sludges, waste oils, waste hydrofluoric acid, scrap metal, pastes and powders, filter scrubber and baghouse wastes
3. Sanitary Refuse	Butler and Allegheny Counties	1960s	Household refuse

Source: PEC Report 1982

AR300044

TABLE 2.2
ALCOA, LOGANS FERRY LEACHATE(a) RESULTS
10-15-1981

PARAMETER	SAMPLE #2 PASTE AREA 4	SAMPLE #6 PASTE AREA 4	SAMPLE #4 POWDER AREA 10	COMPOSITE SAMPLE ⁺ (b)
<u>Heavy Metals (mg/l)</u>				
Arsenic	<0.5	<0.5	<0.5	<0.5
Barium	<1.0	<1.0	<1.0	<1.0
Cadmium	<0.1	<0.1	<0.1	<0.1
Chromium (total)	<0.5	<0.5	<0.5	<0.5
Cr ⁶⁺ , mg/l	<0.05	<0.05	<0.05	<0.05
Lead, mg/l	0.54	<0.5	<0.5	<0.5
Silver	<0.5	<0.5	<0.5	<0.5
Selenium	<0.1	<0.1	<0.1	<0.1
<u>Volatile Organics, ppb</u>				
Toluene	ND	ND	0.4	0.4
Methylene chloride	5.5	3.8	5.2	5.5
Dichlorobromomethane	0.3	0.5	1.2	1.2
Trichloroethylene	0.1	ND	0.1	0.1
Benzene	0.6	0.4	0.5	0.4
Chloroform	ND	0.2	0.2	0.1
<u>Base-Neutrals, ppb</u>				
Bis (2-ethylhexyl) phthalate	6.5	8.0	30.0	7.5
Di-n-butylphthalate	ND	4.6	ND	2.8
Pesticides(6)(c)	ND	ND	ND	ND
Final Leachate pH	5.0	4.7	4.8	4.2

ND - Not detected

(a)All leachate analyses were conducted by the Analytical Chemistry Division, ATC.

(b)Composite sample consisted of the following samples:

#5 Paste Area 3, #1 Paste Area 10, #2 Still Residue Area 5

(c)Pesticides analyzed with detection limits are listed below:

Detection Limit, ppb

1. Endrin	1
2. Lindane	1
3. Toxaphene	10
4. Methoxychlor	10
5. 2,4-D	100
6. 2,4,5-TP	100

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Source: Alcoa files.

TABLE 2.3
ASH PILE CHARACTERISTICS

PARAMETER	UNITS	VALUE	HOW DETERMINED
Surface Area	SF	26,300	Field survey
Volume	CY	2,800	Field survey
Mass	TON	2,800	Field observations; 1 CY = 1 TON
Porosity	-	0.6	Field observation; soil mechanics calculations based on unit weights and degree of saturation
Mean Grain Size (d_{50})	mm	1.0	Laboratory analysis
pH	-	7.3	Average from laboratory testing
Total Neutralization Potential	% CaCO_3 Equivalent	4.02	Average from laboratory testing performed on minus 60 mesh material (0.25 mm)
Potential Acidity	% CaCO_3 Equivalent	0.65	Average from laboratory testing performed on minus 60 mesh material (0.25 mm)
Net Neutralization Potential	% CaCO_3 Equivalent	3.37	Total neutralization potential minus potential acidity
Available Neutralization Potential	% CaCO_3 Equivalent	0.67	Assumed to be 20 percent of net based on particle size differences between in-field material and laboratory testing
Cadmium Concentration in Leachate at pH 5	mg/l	0.80	Weighted average from laboratory testing
Lead Concentration in Leachate at pH 5	mg/l	3.73	Weighted average from laboratory testing

Source: D'Appolonia files.

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TABLE 2.4
CHEMICAL CHARACTERISTICS
OF ASH RESIDUE(a)

PARAMETER	UNITS	SAMPLE IDENTIFICATION					
		TP-A	TP-B	TP-C	TP-D	TP-E	TP-F
Reaction pH(b)	pH units	6.75	7.70	7.50	7.75	7.50	7.35
Potential Acidity(c)	% CaCO_3 Equivalent	0.09	0.78	0.62	0.94	0.50	0.94
Neutralization Potential	% CaCO_3 Equivalent	2.4	5.4	2.4	7.0	2.8	4.1

(a) Analytical determinations by D'Appolonia in accordance with Sobek, et al. (1978); Black, ed. (1965).

(b) Equilibrium pH of a 1:1 waste:distilled water mixture at 25 degrees Celsius.

(c) Percent CaCO_3 equivalent required to neutralize.

Source: D'Appolonia files.

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TABLE 2.5
SUMMARY OF EP TOXICITY
ANALYSIS FOR HEAVY METALS(a)

PARAMETER	UNITS	CRITERIA FOR DESIGNATION AS EP TOXIC(b)	CONCENTRATION(c)
Arsenic	mg/l	5.0	0.001
Barium	mg/l	100.0	1.1
Cadmium	mg/l	1.0	0.80
Chromium	mg/l	5.0	0.03
Lead	mg/l	5.0	3.73
Mercury	mg/l	0.2	<0.0002
Selenium	mg/l	1.0	0 <.008
Silver	mg/l	5.0	<0.01

(a) Analysis performed in accordance with procedure given in 40 CFR 261, Appendix B.

(b) 40 CFR 261.24.

(c) Weighted-average concentration calculated from all collected data as described in text and Tables 6 and 7C (Appendix F).

Source: D'Appolonia files.

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TABLE 2.6
RESULTS OF TOTAL METAL ANALYSIS
ASH COMPOSITE SAMPLES 2(a)

PARAMETER	UNITS	CONCENTRATION
Arsenic	mg/kg	5.9
Barium	mg/kg	1,980
Cadmium	mg/kg	100
Chromium	mg/kg	645
Lead	mg/kg	4,060
Mercury	mg/kg	3.2
Selenium	mg/kg	4.1
Silver	mg/kg	4.0

(a)Analyses performed on extract from ASTM 1:4 acid digestion.

Source: D'Appolonia files.

AR300049

TABLE 2.7
BORING LOGS FOR SOIL SAMPLES
HRANICA SITE

DEPTH
IN FEET

TP #1 (1/13/82)

0.0-6.0	Light brown SILT, some fine sand, trace clay, trace fragments, very soft, dry to damp
6.0-10.0	Light brown to buff SILT and/some SAND, trace clay, brownish orange with depth, soft, damp to moist, BEDROCK at approximately 9.0'
10.0-12.3	SANDSTONE, brown, carbonaceous shale stringers, vugs, highly micaceous, iron staining on horizontal (bedding plan) fractures, BROKEN. Carbonaceous shale zone (11.3-11.4) solvent smell
12.3-14.0	SANDSTONE, gray, highly micaceous, vugs, iron staining on horizontal fractures, BROKEN
14.0-19.0	SANDSTONE, gray, medium grained, micaceous, horizontal fractures with iron staining, BROKEN

TP #2 (1/13/82)

0.0-4.5	Brown and orange SILT, some fine SAND, little clay, mottled, dry to damp
4.5-8.0	Brown and orange SILT and fine SAND, dry
8.0-12.0	Medium to dark brown SILT, little sand, trace clay, dry to damp
12.0-14.0	SANDSTONE, brown, weathered, BEDROCK

TP #3 (1/4/82)

0.0-2.0	Light orange to brown SILT, little fine sand, little to trace clay, little to trace fragments, occasional clay lenses, organics (roots), soft to firm, damp to moist
2.0-4.0	Reddish-brown and brown SILT, some clay in layers, little sandy lenses, trace fragments, trace organics(roots); damp
4.0-14.0	Light brown SILT, little fine sand, little clay in lenses, trace fragments, dry

AR300050

TABLE 2.7
(Continued)

DEPTH
IN FEET

14.0-22.0	Reddish-brown to brown SILT, little clay (red clay lenses - possibly claystone bedrock), damp
22.0-24.0	Brown SILT, little clay, little fragments, damp
24.0-26.0	Tan to brown SILT, some clay, damp to moist
26.0-30.0	Brown to gray SILT, some clay, trace iron-stained fragments of gray claystone, damp
30.0-32.0	Same as 26.0-30.0, harder augering at 31.4' then soft, wet, SHALE, gray, weathered on auger tip
32.0-34.0	SHALE, gray, on auger with refusal, little return

TB #4 (1/7/82)

0.0-11.0	Brown-orange-gray SILT, little clay, little sand, trace fragments, earthy odor, upper 3 to 4" mottled, dry to damp
11.0-14.0	Orange-brown SILT and CLAY, trace sand, trace fragments, damp
14.0-17.0	Brown SILT, little sand, trace clay, trace fragments, earthy odor, damp
17.0-20.0	Brown SILT, some clay, little fragments, little to trace sand, moist
20.0-34.0	Red SILT and FRAGMENTS (sandstone), trace sand, trace clay, BEDROCK
34.0-39.0	CLAYSTONE, gray, BEDROCK (cored interval)

TP #5 (1/4/82)

0.0-2.0	Brown-orange SILT, some clay, trace to little sand, mottled, damp
2.0-4.0	Brown SILT and/some fine SAND, trace sandstone fragments, trace clay, dry to damp
4.0-6.0	Brown SILT, little fine sand, trace fragments, trace clay, dry
6.0-11.5	Same as above, some fine sand, orange brown SILT with oxidized claystone fragment at end of run

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TABLE 2.7
(Continued)

DEPTH
IN FEET

11.5-14.0	CLAYSTONE, gray and orange, weathered, iron stained
14.0-15.3	SHALE, dark gray, sandy, weathered, horizontal and vertical fracturing with iron staining, BROKEN
15.3-19.0	SANDSTONE, yello-brown, iron stained

TP #6 (1/5/82)

0.0-2.0	Medium to brown to orange SAND, some silt, little rock fragments (weathered, iron stained sandstones) little to trace clay, mottled, moist to damp
2.0-8.0	Brown SILT and REFUSE, soft, moist to wet
8.0-10.0	Dark and light brown SILT and REFUSE, some sand, trace fragments, trace clay, sanitary smell, moist
10.0-11.0	Dark greenish gray SILT, little sand, trace clay, trace fragments, organics(roots), sanitary smell, moist, TOPSOIL
11.0-14.0	Reddish brown SILT, some clay, damp
14.0-16.0	Reddish brown SILT and CLAY, iron stained, damp on top. Yellow-brown SILT with depth, some to little clay, little to trace very fine sand, dry
16.0-18.0	Brown SILT, little clay, dry to damp, grading into reddish and gray SILT and claystone FRAGMENTS
18.0-24.0	Red SILT and CLAYSTONE FRAGMENTS, dry, BEDROCK

TB #7 (1/5/82)

0.0-2.0	Brown to green SAND, little sandstone fragments, little silt, little refuse, organics (roots), solvent smell, damp
2.0-4.0	Gray green SAND, some to little silt, little to trace refuse, trace clay, trace sandstone fragments, strong chemical odor, moist
4.0-6.0	Same as above, increased refuse content
6.0-12.0	Same as above, wet, strong solvent and sanitary odor

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TABLE 2.7
(Continued)

DEPTH
IN FEET

12.0-19.0 Same as above, damp, BEDROCK
22.0-34.0 Red SILT, little clay, little claystone fragments, damp, BEDROCK

TB #8 (1/6/82)

0.0-9.0 Brown SILT, some refuse, some to little fine sand, sanitary smell, soft, damp
9.0-13.0 Gray and brown SILT, some refuse, little fine sand, sanitary smell, soft, damp to moist, BEDROCK
13.0-18.0 Gray SILT, little sand, little fragments, little to trace clay, trace refuse, sanitary smell, moist to wet on top, damp in lower auger sample, CLAYSTONE, gray, BEDROCK
18.0-24.0 Brown SILT, some clay, little gray claystone fragments, earthy odor, dry to damp, BEDROCK
24.0-28.0 CLAYSTONE, red and gray, soft to firm, earthy odor, dry

TB #9 (1/8/82)

0.0-1.0 Dark brown SILT and ORGANICS
1.0-2.0 Dark brown SILT and CLAY, trace sand, damp to moist
2.0-3.0 Medium brown SILT, some fine sand, trace clay, damp
3.0-10.0 Orange-brown fine SAND, some clay, trace silt, dry
10.0-14.0 Yellow-brown fine SAND, little silt, trace clay, trace fragments, dry
14.0-16.0 SANDSTONE, gray, BEDROCK

TB #10 (1/15/82)

0.0-4.0 Brown SILT, little clay, trace sand, damp
4.0-5.0 CLAYSTONE, red, dry, BEDROCK
5.0-6.0 SHALE, brown, weathered, BEDROCK

Source: PEC Report (1982).

AR300053

TABLE 2.8

PEC DATA

GENERALIZED SECTION OF THE CONEMAUGH FORMATION IN BUTLER COUNTY(a)

	THICKNESS IN FEET
<u>Casselman Formation</u>	
Morgantown Sandstone Member:	
Shale, gray-green, sandy, and thin-bedded; also thin-bedded sandstone	110
Unnamed unit:	
Coal, Wellersburg	0-1
Birmingham Shale Member:	
Shale, variegated to red, sandy; contains marine fossils	30
Unnamed unit:	
Coal, Duquesne	0-2+
Shale, brown	55
<u>Glenshaw Formation</u>	
Ames Limestone Member:	
Limestone, greenish-gray, siliceous; contains abundant marine fossils	0-5
Coal, Harlem	1/2
Limestone, fresh-water type	0-2
Shale, silty, reddish; in places interbedded with gray shale ("Pittsburgh red beds" of local usage)	0-35
Saltsburg Sandstone Member:	
Sandstone, massive, lenticular; in places sandy shale and thin-bedded sandstone	0-30
Shale, dark-gray; marine fossils locally abundant	0-5
Coal, Bakerstown	0-1
Cambridge Limestone Member:	
Limestone, blue-gray, sandy, lenticular	0-2
Buffalo Sandstone Member:	
Sandstone, variable thickness, massive to thin bedded	130
Brush Creek Limestone Member:	
Limestone; marine fossils locally abundant	0-5
Coal, Brush Creek	0-3
Unnamed unit:	
Shale and sandstone	160
Mahoning Member:	
Shale, red (Mahoning Red Bed of Swartz, 1922, p. 55)	1
Coal, Mahoning	0-2+
Limestone, fresh-water type (Mahoning Limestone of White, 1891)	0-2
Sandstone, light-yellow-brown, medium- to coarse-grained, cross-bedded massive to thin-bedded	70-100

MAXIMUM TOTAL

640

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(a) Obtained from "Patterson, Elmer D.; and Lieu, J. A., 1971, Coal Resources of Butler County, Pennsylvania, Geological Survey Bulletin 1143-C."

Source: PEC Report (1982).

TABLE 2.9
WELL CONSTRUCTION DETAILS

WELL NUMBER	DATE COMPLETED	SURFACE ELEVATION(ft)	DEPTH (ft)	TYPE	SIZE DIAMETER	CASING		MONITORED INTERVAL	GROUTING		REMARKS
						ZONE	PERFORATED		ZONE	TYPE	
GW1	1/13/82	1274.84	11.9	PVC Sch 80	2"	11.9'-6.9'		11.9'-6'	6-0'	Cement-Bentonite Slurry	Bentonite fill 19'-12.5'; gravel 12.5'-11.9' DRY
GW2	1/14/82	1250.85	14.0	PVC Sch 80	2"	14'-10'		14'-8'	8-0'	Cement-Bentonite Slurry	Gravel fill 15'-14' 2' stickup
GW3	1/5/82	1171.45	33.0	PVC Sch 80	2"	33'-28'		33'-21'	21-0'	Cement-Bentonite Slurry	Gravel fill 34'-33'
GW4	1/7/82	1156.31	23.0	PVC Sch 80	2"	23'-18'		23'-16'	16-0'	Cement-Bentonite Slurry	Sand fill 23.5'-23.0'
GW5	1/14/82	1248.09	15.35	PVC Sch 80	2"	15.35'-10.35'		15.35'-9'	9-0'	Cement-Bentonite Slurry	Bentonite fill 19-16'; sand 16'-15.35' DRY 2' stickup
GW7	1/5/82	1211.07	21.3	PVC Sch 80	2"	21.3'-16.3'		21.3'-14'	14-0'	Cement-Bentonite Slurry	
GW9	1/13/82	1258.42	14.9	PVC Sch 80	2"	14.9'-12'		14.9'-10'	10-0'	Cement-Bentonite Slurry	Sand fill 16'-14.9'; 16'-14.9' DRY 2' stickup

See Drawing 165-03-S1 for well locations.

See Figure 2-2 for typical geologic section.

Source: GFD Report, 1982.

AR30 0055

TABLE 2.10
PEC SURFACE WATER SAMPLING LOCATIONS
(PEC Report, July 1982)

- A and B - PEC Sampling Points No. 1 and No. 2 - Ravine Seeps Off Site to East - December 1, 1981
- C - FIT Sampling Point No. 4 (EPA Analytical) Ravine Seeps Off Site to East - April 7, 1981
- D - PEC Sampling Point No. 3 - Oak Tree Seep South of Site - December 1, 1981
- E - FIT Sampling Point No. 2 Oak Tree Stream - April 7, 1981
- F - FIT Sampling Point No. 3 - Oak Tree Seep - April 7, 1981
- G - PEC Sampling Point No. 4 - Obringer Springhouse - December 1, 1981
- H - FIT Sampling Point C0504 - Obringer Springhouse - April 8, 1981
- I - FIT Sampling Point C0505 - Obringer Stream - April 8, 1981
- J - PADER Sampling Point - Obringer Springhouse - November 24, 1981
- K - PADER Sampling Point - Obringer Water Tap - November 24, 1981
- L - U.S. EPA C0505 - Obringer Farm Stream - April 8, 1981
- M - PEC Sampling Point No. 6 - Stream West of Site - December 1, 1981
- N - FIT Sampling Point No. 1 - Seep - April 7, 1981
- O - FIT Sampling Point C0500 - Upstream - April 8, 1981
- P - FIT Sampling Point C0502 - Downstream - April 8, 1981
- Q - PEC Sampling Point No. 7 - Little Bull Creek Upstream - December 1, 1981
- R - PEC Sampling Point No. 8 - East Ravine Stream before Little Bull Creek - December 1, 1981
- S - PEC Sampling Point No. 9 - Oak Tree Ravine Stream before Little Bull Creek - December 1, 1981
- T - PEC Sampling Point No. 10 - Little Bull Creek - Downstream - December 1, 1981
- U - PADER Sampling Point - William Hranica pool beside shanty - November 24, 1981

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TABLE 2.11
PEC GROUND WATER SAMPLING LOCATIONS
(PEC - Report July, 1982)

- A - PEC Sampling Point TB3 - Slightly West of Ravine Seeps - January 21, 1982
- B - PEC Sampling Point TB4 - Slightly south of Ravine Seeps - January 21, 1982
- C - PEC Sampling Point TB7 - West end of Old Municipal Landfill Area -
January 21, 1982
- D - PADER Sampling Point - Precision Grinding Upstairs Sink Tap -
April 28, 1981
- E - PADER Sampling Point - Precision Grinding Upstairs Sink Tap -
November 24, 1981
- F - PADER Sampling Point - Paul Hranica BSMT Water Tap - November 24, 1981
- G - PADER Sampling Point - Pajer Barn Tap - November 24, 1982
- H - PADER Sampling Point - Butler Junction Municipal Water - November 24, 1981

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TABLE 2.12
PEC RESULTS OF SEDIMENT AND SOILS ANALYSES
(PEC Report, July 1982)

PARAMETER	MASTER LOCATION NUMBER (RESULTS IN MG/L)								
	S1	S2	S3	S4	S5	S6	S7	S8	S9
<u>EP Leachate</u>									
Al	<0.1	<0.1	<0.1	-	-	-	-	-	-
Ba	0.5	0.2	0.3	-	-	-	-	-	-
Cd	<0.01	<0.01	<0.01	-	-	-	-	-	-
Cr	<0.01	<0.01	<0.01	-	-	-	-	-	-
Cu	0.01	<0.01	<0.01	-	-	-	-	-	-
Pb	<0.03	<0.03	<0.03	-	-	-	-	-	-
Hg	0.0010	<0.0005	0.0066	-	-	-	-	-	-
Ag	<0.01	<0.01	<0.01	-	-	-	-	-	-
Zn	0.80	0.27	0.28	-	-	-	-	-	-
As	0.011	<0.001	0.002	-	-	-	-	-	-
Se	<0.002	<0.002	<0.002	-	-	-	-	-	-
<u>Sediment Tests</u>									
Phenols (mg/kg)	3.9	4.6	0.36	-	-	-	-	-	-
PCB (mg/kg)	1.7	0.28	<0.01	-	-	-	-	-	-
Volatile Organic Carbon (ug/kg)	-	<10	<10	<10	<10	<10	*	-	*
TCE (ug/kg)	165	-	-	-	-	-	-	-	-
Benzene (ug/kg)	-	-	-	-	-	-	-	589	-

Note: S1 through S3 are sediment samples.
S4 through S9 are soil samples.

*Unable to complete analysis due to high concentration of semivolatile and nonvolatile organics

AR300058

TABLE 2.13
SUMMARY OF PEC SURFACE WATER ANALYSES (mg/l)
(PEC Report, July 1982)(a)

SAMPLING LOCATIONS(b)	SURFACE WATER NO. 1				SURFACE WATER NO. 2				SURFACE WATER NO. 3				SURFACE WATER NO. 4			
	A	B	C	D	E	F	G	H	I	J	K	L				
pH	6.9	6.8	-	6.9	-	-	6.6	-	-	6.4	6.4	-				
Phenol	0.37	0.79	-	0.014	0.094	-	0.039	-	-	-	-	-				
Total Organic Carbon (TOC)	107	80.2	-	27.2	-	-	33.8	-	-	-	-	-				
Total Organic Halogen (TOH)	417	557	-	264	-	-	24	-	-	-	-	-				
Total Dissolved Solids (TDS)	291	391	-	211	-	-	42	-	-	152	162	-				
Iron (Fe)	97	115	.89/6.4	0.16	3.2	0.31	1.58	0.32	0.2	1.27	0.1	0.2				
Manganese (Mn)	2.7	2.53	<0.02/0.19	0.39	0.38	0.11	2.35	0.15	<0.01	2.07	<0.02	<0.01				
Chloride (Cl)	52	42	-	23	-	-	8.3	-	-	-	-	-				
Sodium (Na)	38	43	0.48/33.8	17	0.38	0.44	5.46	5	3.1	-	-	3.1				
Sulfates (SO ₄)	12	3.8	-	13	-	-	<1	-	-	-	-	-				
Cyanides (CN)	0.009	0.007	-	<0.005	-	-	<0.005	-	-	-	-	-				
Arsenic (As)	<0.001	<0.001	<0.01/0.01	<0.001	-	-	<0.001	<0.01	<0.01	-	-	<0.01				
Barium (Ba)	0.6	0.5	-	<0.1	<0.05	<0.05	<0.1	0.01	0.01	-	-	0.01				
Cadmium (Cd)	<0.01	<0.01	<0.01/<0.005	<0.01	<0.01	<0.01	<0.01	<0.005	<0.005	<0.01	<0.01	<0.005				
Chromium (Cr)	0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.01				
Lead (Pb)	<0.03	<0.03	0.004	<0.03	0.003	0.003	<0.03	<0.04	0.04	<0.05	<0.05	0.04				
Mercury (Hg)	0.033	0.068	<0.0002	<0.0005	<0.0002	<0.0002	<0.0005	<0.001	<0.001	<0.0005	<0.0005	<0.001				
Selenium (Se)	<0.002	<0.002	<0.01	0.007	-	-	0.002	<0.01	<0.01	-	-	<0.01				
Silver (Ag)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	-	-	<0.02				
Zinc (Zn)	0.2	0.03	0.02/0.03	<0.01	0.03	0.02	<0.01	0.09	0.09	<0.01	0.1	0.09				
Copper (Cu)	0.03	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.01	0.02	<0.02				
Aluminum (Al)	2	<0.1	<0.1/0.6	<0.1	<0.1	<0.1	<0.1	<0.01	0.2	0.1	<0.1	0.2				
Magnesium (Mg)	14	16	0.36/11.2	102	0.47	0.46	6	4.8	3.8	-	-	3.8				
Base/Neutral (PCB)	1 peak	no peaks	-	No peaks	-	-	PCB 1254 (0.1-1 ppb)	-	-	-	-	-				
Acid Extractable (ppb)	<0.01	<0.01	-	<0.01	-	-	<0.01	<0.01	-	-	-	-				
Volatiles (ppb)	<0.01	<0.01	-	<0.01	-	-	<0.01	-	-	-	-	-				
Pesticides (ppb)	<0.001	<0.001	-	<0.001	-	-	<0.001	-	-	-	-	-				

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TABLE 2.13
(Continued)

SAMPLING LOCATIONS(b)	SURFACE WATER NO. 5			SURFACE WATER NO. 6			SURFACE WATER NO. 7			SURFACE WATER NO. 8			SURFACE WATER NO. 9			SURFACE WATER NO. 10		
	M	N	O	P	Q	R	S	T	U									
pH	6.8	-	-	-	7.1	7.4	7.2	7.3	-									
Phenol	0.021	-	-	-	<0.01	0.019	<0.01	<0.01	-									
Total Organic Carbon (TOC)	7.34	-	-	-	15.3	26.3	7.31	21.1	-									
Total Organic Halogen (TOH)	18	-	-	-	28	66	21	21	-									
Total Dissolved Solids (TDS)	115	-	-	-	164	195	129	204	-									
Iron (Fe)	0.5	<0.02	1.74	1.44	0.87	1.33	0.31	1.02	-									
Manganese (Mn)	0.16	<0.02	0.07	0.44	0.35	0.36	0.34	0	-									
Chloride (Cl)	11	-	-	-	14	24	10	22	-									
Sodium (Na)	6.27	0.3	2.5	12.4	7.17	11	2.99	10	-									
Sulfates (SO ₄)	41	-	-	-	47	40	44	48	-									
Cyanides (CN)	<0.005	-	-	-	<0.005	<0.005	<0.005	0.006	-									
Arsenic (As)	<0.001	-	<0.01	<0.01	0.004	0.005	0.003	0.003	-									
Barium (Ba)	<0.1	<0.05	0.01	0.01	<0.1	<0.1	<0.1	<0.1	-									
Cadmium (Cd)	<0.01	<0.01	<0.005	<0.005	<0.01	<0.01	<0.01	<0.01	-									
Chromium (Cr)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-									
Lead (Pb)	<0.03	0.02	<0.04	<0.048	<0.03	<0.03	<0.03	<0.03	-									
Mercury (Hg)	<0.0005	<0.0002	<0.001	<0.001	<0.0005	<0.0005	<0.005	<0.005	-									
Selenium (Se)	<0.002	-	<0.01	<0.01	<0.002	<0.002	<0.002	<0.002	-									
Silver (Ag)	<0.01	<0.01	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	-									
Zinc (Zn)	0.01	0.02	0.07	0.03	0.01	<0.01	<0.01	<0.01	-									
Copper (Cu)	<0.01	<0.01	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	-									
Aluminum (Al)	<0.1	<0.1	0.5	0.5	0.3	0.1	<0.1	<0.3	-									
Magnesium (Mg)	4.8	0.32	4.1	6.5	5.6	8.8	5.5	6.9	-									
Base/Neutral (PCB)	PCB 1254	-	-	-	No peaks	No peaks	No peaks	No peaks	(<0.0002 ppm) PCB									
Acid Extractable (ppb)	<0.001	-	-	-	<0.001	<0.001	<0.001	<0.001	-									
Volatiles (ppb)	<0.01	-	-	-	<0.01	Trichloroethylene (35 ppb)	<0.01	<0.01	-									
Pesticides (ppb)	<0.001	-	-	-	<0.001	<0.001	<0.001	<0.001	-									

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(a) PEC Report July 1982, Project No. 6110-03, prepared by PPG Industries.
(b) For sampling locations, refer to Table 2.11.

TABLE 2.14
SUMMARY OF PEC GROUND WATER ANALYSES (mg/l)
(PEC Report, July 1982)(a)

SAMPLING LOCATIONS(b)	GROUND WATER NO. 3	GROUND WATER NO. 4	GROUND WATER NO. 7	GROUND WATER NO. 11	GROUND WATER NO. 12	GROUND WATER NO. 13	GROUND WATER NO. 14
	A	B	C	D	E	F	G
pH	7.7	7.9	7.4	7.0	7.1	6.7	6.6
Phenol	0.04	0.02	0.22	0.0025	-	-	-
Total Organic Carbon (TOC)	54.2	52.6	151	40	-	-	-
Total Organic Halogen (TOH)	102	190	-	-	-	-	-
Total Dissolved Solids (TDS)	553	852	724	336	326	154	174
Iron (Fe)	3.44	2.44	21	0.88	0.92	<0.05	12.7
Manganese (Mn)	-	-	-	0.15	0.14	<0.02	0.56
Chloride (Cl)	96	90	41	30	-	-	-
Sodium (Na)	27	172	78	-	-	-	-
Sulfates (SO ₄)	32	360	25	15	-	-	-
Cyanides (CN)	<0.005	<0.005	<0.005	-	-	-	-
Arsenic (As)	-	-	-	-	-	-	-
Barium (Ba)	0.1	0.1	0.06	-	-	-	-
Cadmium (Cd)	<0.01	<0.01	<0.01	0.001	<0.01	<0.01	<0.1
Chromium (Cr)	<0.01	0.02	0.02	0.01	<0.02	<0.02	<0.2
Lead (Pb)	<0.03	<0.03	0.22	0.01	<0.05	<0.05	0.05
Mercury (Hg)	<0.0002	0.0006	0.0032	-	<0.0005	<0.0005	<0.0005
Selenium (Se)	-	-	-	-	-	-	-
Silver (Ag)	<0.01	<0.01	<0.01	-	-	-	-
Zinc (Zn)	0.03	0.02	0.77	0.58	0.14	<0.01	0.02
Copper (Cu)	<0.01	0.01	0.04	0.05	<0.01	0.01	0.01
Aluminum (Al)	2.7	2.8	40.4	0.01	<0.1	<0.1	<0.1
Magnesium (Mg)	30.7	20.4	21.5	-	-	-	-
Volatile Organic Carbon	Toluene @ 1 ppb	<0.01	Benzene @ 2 ppb Bromoform @ 2 ppb Carbon Tetrachloride @ 2 ppb Chlorodibromo methane @ 2 ppb Chloroform @ 1 ppb 1,1 Dichloroethene @ 1 ppb 1,3 Dichloropropylene @ 1 ppb Tetrachloroethylene @ 2 ppb Toluene @ 4 ppb 1,2 Trans Dichloroethylene @ 2 ppb 1,1,1-Trichloroethane @ 1 ppb Trichloroethylene @ 2 ppb	-	-	-	-
Acid Extractables	<0.025	<0.025	2,4-Dimethyl phenol @ 20 ppb 4-Nitrophenol @ 2 ppb	-	-	-	(<0.0002 ppm) PCB
Base/Neutral (PCB)	Bis (2-ethyl hexyl) phthalate @ 76 ppb 1,3-Dichlorobenzene @ 40 ppb	<0.04	Naphthalene @ 400 ppb	-	(<0.0002 ppm) PCB	(<0.0002 ppm) PCB	(<0.0002 ppm) PCB
Pesticides	<0.02	<0.02	s-BHC @ 0.08 ppb γ-HCH @ 0.34 ppb 4-4' DDD @ 0.1 ppb B-Endosulfan @ 0.1 ppb	-	-	-	-

(a) PEC Report, July 1982.
(b) For sampling locations, refer to Figure 2-6 and Tables 2.10 and 2.11

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TABLE 2.15

PHYSICAL AND CHEMICAL DATA FOR
GROUND WATER MONITORING WELL NO. 3 (GH-3)

PARAMETER	UNIT	9/17/83	6/4/84	10/16/84	1/17/85	4/17/85	7/17/85	11/8/85	2/10/86	4/25/86	7/25/86
		IT	ESC	ESC	ESC	PADER	ESC	ESC	ESC	ESC	ESC
Field Tests:											
Water Level(a)	ft below top of PVC casing	-	21.5	24.8	22.7	-	22.1	24.5	22.5	22.6	22.6
Estimated Flow	l/hr	-	NK(b)	-	-	-	-	-	-	-	-
pH	ph units	-	6.30	6.20	6.40	-	5.80	5.9	5.1	5.35	6.10
Specific Conductance @ 25°C	umhos/cm	-	600	700	700	-	600	NH	500	490	500
Temperature	°C	-	16	10	2	-	9	8.0	6	12	14
Laboratory Tests:											
pH	ph units	-	6.90	6.90	7.00	-	6.85	6.8	6.5	6.2	6.4
Specific Conductance @ 25°C	umhos/cm	-	495	600	750	-	700	700	500	500	500
Aluminum	mg/l	-	NR(d)	NR	0.2	-	0.9	<0.1	<0.1	<0.1	<0.1
Antimony	mg/l	<0.001	<0.1	<0.1	0.6	-	<0.1	0.3	0.2	<0.1	0.1
Arsenic	mg/l	0.183	0.02	0.01	0.026	-	<0.001	0.004	0.007	0.003	0.002
Beryllium	mg/l	0.004	<0.01	<0.01	<0.01	-	<0.01	<0.10	0.01	<0.01	<0.01
Cadmium	mg/l	0.011	<0.01	0.001	0.02	-	0.03	<0.01	<0.01	0.01	<0.01
Chromium	mg/l	0.042	0.02	<0.01	<0.01	-	0.01	<0.01	0.01	<0.01	<0.01
Copper	mg/l	1.10/1.09	0.03	0.05	0.045	-	0.02	<0.01	0.03	0.03	<0.01
Iron	mg/l	NH	NR	NR	0.1	-	<0.1	<0.1	0.2	0.2	<0.1
Lead	mg/l	0.26	0.20	0.03	<0.01	-	0.09	0.04	0.06	<0.01	<0.01
Manganese	mg/l	NH	NR	NR	1.2	-	0.83	1.4	0.75	0.71	0.73
Mercury	mg/l	0.002	<0.0005	<0.0005	<0.0005	-	0.0007	<0.0005	<0.0005	<0.0005	<0.0005
Nickel	mg/l	0.61	<0.1	0.1	0.2	-	<0.1	<0.1	<0.1	<0.1	<0.1
Selenium	mg/l	<0.001	0.04	0.010	<0.002	-	<0.002	<0.001	<0.001	<0.001	<0.001
Sodium	mg/l	NH	NR	NR	21	-	26	24	28	29	29
Silver	mg/l	<0.001	0.01	0.01	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01
Thallium	mg/l	<0.001	<0.005	<0.010	<0.010	-	<0.010	<0.010	<0.010	<0.010	<0.010
Zinc	mg/l	0.95	0.08	0.13	0.37	-	1.13	0.01	0.04	0.06	0.04
Total Organic Carbon(d)	mg/l as C	18	6/7	3/3	39/41	-	3.9/3.8	5.4/5.0	8	10	10
Total Organic Halogen(d)	mg/l as Cl	0.8	0.073/0.072	0.059/0.056	0.120/0.110	-	<0.020/0.020	0.064/0.069	0.060/0.064	0.082	0.080
Sulfate	mg/l	NH	NR	NR	17.5	-	32	20	12	11	10
Chloride	mg/l	NH	NR	NR	86.0	-	71	7.2	68	13	14
Phenolics	mg/l	0.05(f)	0.30	<0.01(f)	<0.01(f)	-	<0.01	<0.01	<0.01	0.48	0.02
Polychlorinated Biphenyls	mg/l	-	<0.001	<0.001	<0.001	-	<0.001	NH	NH	NH	NH
Volatile Organics (Purgeables):											
Acrolein	ug/l	(g)	-	<100	<100	-	<100	<5	<5	<5	<5
Acrylonitrile	ug/l	<10	<1	<100	<100	-	<100	<5	<5	<5	<5
Benzene	ug/l	3.4	<1	<5	<5	-	<5	<5	<5	<5	<5

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See footnotes at end of table.

TABLE 2.15
(Continued)

PARAMETER	UNIT	9/17/83	6/4/84	10/15/84	1/17/85	SAMPLING DATE	7/17/85	11/8/85	2/10/86	4/25/86	7/24/86
		IT	PADEX	ESC	PADEX	ESC	PADEX	ESC	ESC	ESC	ESC
Volatile Organics (Purgeables):											
Carbon Tetrachloride	ug/l	<1.0	-	<1	-	<5	-	<5	<5	<5	<5
Chlorobenzene	ug/l	<1.0	-	<1	-	<5	-	<5	<5	<5	<5
1,2-Dichloroethane	ug/l	<1.0	-	<1	1.0	<5	-	<5	<5	<5	<5
1,1,1-Trichloroethane	ug/l	<1.0	-	<1	-	<5	-	<5	<5	<5	<5
1,1-Dichloroethane	ug/l	<1.0	1.2	<1	-	<5	-	<5	<5	<5	<5
1,1,2-Trichloroethane	ug/l	<1.0	-	<1	-	<5	-	<5	<5	<5	<5
1,1,2,2-Tetrachloroethane	ug/l	<1.0	-	<1	-	<5	-	<5	<5	<5	<5
Chloroethane	ug/l	<1.0	-	<1	-	<10	-	<10	<10	<10	<10
2-Chloroethylvinyl Ether	ug/l	<1.0	-	<1	-	<10	-	<10	<10	<10	<10
Chloroform	ug/l	<1.0	-	<1	-	<5	-	<5	<5	<5	<5
1,1-Dichloroethylene	ug/l	11	-	<1	-	<5	-	<5	<5	<5	<5
Trans-1,2-Dichloroethylene	ug/l	<1.0	-	1	1.3	<5	4.3	<5	<5	<5	<5
1,2-Dichloropropane	ug/l	<1.0	-	<1	-	<5	-	<5	<5	<5	<5
1,2-Dichloropropylene	ug/l	-	-	<1	-	<5	-	<5	<5	<5	<5
Ethylbenzene	ug/l	11	10	<1	1.2	<5	-	<5	<5	<5	<5
Methylbenzene Chloride	ug/l	3.6	-	3	-	<5	-	<5	<5	<5	<5
Methyl Chloride	ug/l	<1.0	-	<1	-	<10	-	<10	<10	<10	<10
Methyl Bromide	ug/l	<1.0	-	<1	-	<10	-	<10	<10	<10	<10
Bromoform	ug/l	<1.0	-	<1	-	<5	-	<5	<5	<5	<5
Dichlorobromomethane	ug/l	<1.0	-	<1	-	<5	-	<5	<5	<5	<5
Trichlorofluoromethane	ug/l	<1.0	-	<1	-	<5	-	<5	<5	<5	<5
Dichlorodifluoromethane	ug/l	<1.0	-	<1	-	<5	-	<5	<5	<5	<5
Chlorodibromomethane	ug/l	<1.0	-	<1	-	<5	-	<5	<5	<5	<5
Tetrachloroethylene	ug/l	9.8	42	<1	-	<5	-	<5	<5	<5	<5
Toluene	ug/l	<1.0	-	<1	-	<5	-	<5	<5	<5	<5
Trichloroethylene	ug/l	<1.0	-	<1	-	<5	1.3	<5	<5	<5	<5
Chloroethylene	ug/l	-	-	<1	-	<10	-	<10	<10	<10	<10
Xylene	ug/l	-	-	<1	-	<10	-	<10	<10	<10	<10
Base Neutral Extractables:											
Naphthalene	ug/l	(m)	-	NR	-	<5	-	<5	NR	NR	NR
Acid Extractable Organics:	ug/l	<1.0	-	NR	-	<5	-	<5	NR	NR	NR
4-mitrophenol	ug/l	-	-	NR	-	<10	-	<10	NR	NR	NR
2,4-Dinitrophenol	ug/l	-	-	NR	-	<10	-	<10	NR	NR	NR

(a) Measurements obtained immediately prior to boiling with the exception of 4/17/85 which was measured on sampling date. Boiling occurs three to four days before sampling.

(b) NA = not available.

(c) NM = not measured.

(d) NR = not requested.

(e) Duplicate results reported.

(f) Onehead for phenols.

(g) Plus <10 ug/l vinyl chloride, and cyanide 0.02 ug/l.

(h) No PCBs or pesticides.

(i) Also: 1,2-dichloroethane, (5.1 ug/l), chlorodifluoromethane and unidentified hydrocarbons.

(j) Also found high molecular weight alkanes.

(k) Plus: 50 ug/l 2-ethyl phthalate

also 2-ethyl hexanol.

(l) Detection level elevated to 15 ug/l due to the presence of methylene chloride in the method blank

(m) Plus 3.9 ug/l di-n-butylphthalate and 6 ug/l leoprene.

Source: IT, PADEX, and ESC files.

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TABLE 2.16
PHYSICAL AND CHEMICAL DATA FOR
SEEP SAMPLES BELOW WELL NO. 7

PARAMETER	UNIT	SAMPLING DATE			
		11/8/85 ESC	2/10/86 ESC	4/25/86 ESC	7/24/86 ESC
<u>Field Tests:</u>					
	Feet below top of PVC casing				
Estimated Flow	l/hr	2,300	230	NM	NM
pH	pH units	6.4	7.20	6.10	6.65
Specific Conductance @ 25°C	umhos/cm	NM(b)	510	510	550
Temperature	°C	9.5	1	11	15
<u>Laboratory Tests:</u>					
pH		7.4	7.30	7.40	7.70
Specific Conductance @ 25°C	umhos/cm	750	600	600	600
Aluminum	mg/l	<0.1	0.6	<0.1	0.2
Antimony	mg/l	0.4	0.4	<0.1	0.4
Arsenic	mg/l	<0.001	0.014	<0.001	0.004
Beryllium	mg/l	<0.010	0.01	<0.01	<0.01
Cadmium	mg/l	<0.01	<0.01	<0.01	<0.01
Chromium	mg/l	<0.01	0.01	0.01	<0.01
Copper	mg/l	0.01	<0.01	0.01	<0.01
Iron	mg/l	<0.1	2.6	0.3	<0.1
Lead	mg/l	0.01	0.01	<0.01	<0.01
Manganese	mg/l	0.17	0.23	0.09	0.22
Mercury	mg/l	<0.0005	<0.0005	<0.0005	<0.0005
Nickel	mg/l	<0.1	<0.1	<0.1	<0.1
Selenium	mg/l	<0.001	<0.001	<0.001	<0.001
Sodium	mg/l	23	20	24	23
Silver	mg/l	<0.01	<0.01	0.01	<0.01
Thallium	mg/l	<0.010	<0.010	<0.010	<0.010
Zinc	mg/l	<0.01	0.03	0.02	0.02
Total Organic Carbon(a)	mg/l	8.2/8.3	8	8	9
Total Organic Halogen(a)	mg/l	0.370/0.410	0.310/0.310	0.34	0.320
Sulfate	mg/l	120	38	17	4
Chloride	mg/l	2.9	1.7	2.0	1.5
Phenolics	mg/l	0.01	0.03	<0.01	<0.01
Polychlorinated Biphenyls	mg/l	NM	NM	NM	NM
Volatile Organics (Purgeables):					
Acrolein	ug/l	<5	<5	<5	
Acrylonitrile	ug/l	<5	<5	<5	
Benzene	ug/l	<5	<5	<5	

See footnotes at end of table.

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TABLE 2.16
(Continued)

PARAMETER	UNIT	SAMPLING DATE			
		11/8/85 ESC	2/10/86 ESC	4/25/86 ESC	7/24/86 ESC
Volatile Organics (Purgeables):					
Carbon Tetrachloride	ug/l	<5	<5	<5	<5
Chlorobenzene	ug/l	<5	<5	<5	<5
1,2-Dichloroethane	ug/l	<5	<5	<5	<5
1,1,1-Trichloroethane	ug/l	<5	<5	<5	<5
1,1-Dichloroethane	ug/l	<5	<5	<5	<5
1,1,2-Trichloroethane	ug/l	<5	<5	<5	<5
1,1,2,2-Tetrachloroethane	ug/l	<5	<5	<5	<5
Chloroethane	ug/l	<10	<5	<5	<5
2-Chloroethylvinyl Ether	ug/l	<10	<5	<5	<5
Chloroform	ug/l	<5	<5	<5	<5
1,1-Dichloroethylene	ug/l	<5	<5	<5	<5
Trans-1,2-Dichloroethylene	ug/l	<5	<5	<5	<5
1,2-Dichloropropane	ug/l	<5	<5	<5	<5
1,2-Dichloropropylene	ug/l	<5	<5	<5	<5
Ethylbenzene	ug/l	<5	<5	<5	<5
Methylene Chloride	ug/l	<5	<5	<5	<5
Methyl Chloride	ug/l	<10	<5	<5	<5
Methyl Bromide	ug/l	<10	<5	<5	<5
Bromoform	ug/l	<5	<5	<5	<5
Dichlorobromomethane	ug/l	<5	<5	<5	<5
Trichlorofluoromethane	ug/l	<5	<5	<5	<5
Dichlorodifluoromethane	ug/l	<5	<5	<5	<5
Chlorodibromomethane	ug/l	<5	<5	<5	<5
Tetrachloroethylene	ug/l	<5	<5	<5	<5
Toluene	ug/l	<5	<5	<5	<5
Trichloroethylene	ug/l	<5	<5	<5	<5
Chloroethylene	ug/l	<10	<5	<5	<5
Xylene	ug/l	<5	<5	<5	<5
Base Neutral Extractables:					
Naphthalene	ug/l	NM	NM	NM	NM
Acid Extractable Organics:					
4-Nitrophenol	ug/l	NM	NM	NM	NM
2,4-Dimethylphenol	ug/l	NM	NM	NM	NM

(a) Duplicate results reported.

(b) NM = not measured.

Source: ESC files.

AR300065

TABLE 2.17
PHYSICAL AND CHEMICAL DATA FOR
SURFACE WATER
ORNLICK'S SPRINGHOUSE

PARAMETER	UNIT	6/4/84	10/16/84	SAMPLING DATE	4/17/85	7/17/85
		ESC	PADER	ESC	PADER	ESC
Field Tests:						
Estimated Flow	l/hr	10	-	NA	-	NO FLOW
pH	pH units	6.30	-	6.90	-	6.00
Specific Conductance @ 25°C	umho/cm	160	-	200	-	174
Temperature	°C	14	-	9	-	10.5
Laboratory Tests:						
pH	pH units	6.95	6.6	7.00	6.8	7.08
Specific Conductance @ 25°C	umho/cm	170	161	185	195	168
Aluminum	mg/l	NR(b)	0.05	NR	0.1	1.3
Antimony	mg/l	<0.1	NH(c)	0.1	0.3	<0.1
Arsenic	mg/l	0.01	0.01	<0.001	0.021	<0.001
Beryllium	mg/l	<0.01	NH	<0.01	0.016	<0.010
Cadmium	mg/l	<0.01	0.001	<0.01	0.01	<0.01
Chromium	mg/l	0.01	0.01	0.01	0.025	0.04
Chromium	mg/l	0.01	0.01	<0.01	0.006	0.04
Copper	mg/l	NR	2.9	NR	4.1	5.6
Iron	mg/l	<0.010	0.01	<0.01	0.09	0.01
Lead	mg/l	NR	2.09	NR	2.5	1.9
Manganese	mg/l	<0.0005	NH	0.003	<0.0005	<0.0005
Mercury	mg/l	0.1	0.01	0.1	0.023	<0.1
Nickel	mg/l	0.03	0.01	0.025	0.006	<0.001
Selenium	mg/l	NR	6.0	NR	5.6	3.5
Sodium	mg/l	0.01	NH	<0.01	0.005	<0.01
Silver	mg/l	<0.005	NH	<0.010	NH	<0.010
Thallium	mg/l	0.04	0.03	0.02	0.032	0.05
Zinc	mg/l	1/1	4.2	2/2	2.2	8.8/8.8
Total Organic Carbon(d)	mg/l as C	0.046/0.046	NH	0.042/0.040	NH	<0.020/0.028
Total Organic Halogen(d)	mg/l	NR	4.0	NR	5.0	17
Sulfate	mg/l	NR	3.0	NR	4.5	3.6
Chloride	mg/l	0.30	0.002(+)	<0.01	<0.001(+)	<0.01
Phenolics	mg/l	<0.001	-	<0.001	-	<0.001
Polychlorinated Biphenyls	ug/l	<1	(f)	<100	(g)	<100
Acrolein	ug/l	<1	-	<100	-	<100
Acrylonitrile	ug/l	<1	-	<100	-	<100
Benzene	ug/l	<1	-	<5	-	<5

See footnotes at end of table.

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TABLE 2.17
(Continued)

PARAMETER	UNIT	6/4/84		10/16/84		SAMPLING DATE 1/17/85		4/17/85		7/17/85	
		ESC	PADER	ESC	PADER	ESC	PADER	ESC	PADER	ESC	PADER
Volatile Organics (Purgeables):											
Carbon Tetrachloride	ug/l	<1	-	<5	-	<5	-	<5	-	<5	-
Chlorobenzene	ug/l	<1	-	<5	-	<5	-	<5	-	<5	-
1,2-Dichloroethane	ug/l	<1	-	<5	-	<5	-	<5	-	<5	-
1,1,1-Trichloroethane	ug/l	<1	-	<5	-	<5	-	<5	-	<5	-
1,1-Dichloroethane	ug/l	<1	-	<5	-	<5	-	<5	-	<5	-
1,1,2-Trichloroethane	ug/l	<1	-	<5	-	<5	-	<5	-	<5	-
1,1,2,2-Tetrachloroethane	ug/l	<1	-	<5	-	<5	-	<5	-	<5	-
Chloroethane	ug/l	<1	-	<10	-	<10	-	<10	-	<10	-
2-Chloroethylvinyl Ether	ug/l	<1	-	<10	-	<10	-	<10	-	<10	-
Chloroform	ug/l	<1	-	<5	-	<5	-	<5	-	<5	-
1,1-Dichloroethylene	ug/l	<1	-	<5	-	<5	-	<5	-	<5	-
Trans-1,2-Dichloroethylene	ug/l	<1	-	<5	-	<5	-	<5	-	<5	-
1,2-Dichloropropane	ug/l	<1	-	<5	-	<5	-	<5	-	<5	-
1,2-Dichloropropylene	ug/l	<1	-	<5	-	<5	-	<5	-	<5	-
Ethylbenzene	ug/l	<1	-	<5	-	<5	-	<5	-	<5	-
Methylene Chloride	ug/l	3	-	<5	-	<5	-	<5	-	<15(E)	-
Methyl Chloride	ug/l	<1	-	<10	-	<10	-	<10	-	<10	-
Methyl Bromide	ug/l	<1	-	<10	-	<10	-	<10	-	<10	-
Bromoform	ug/l	<1	-	<5	-	<5	-	<5	-	<5	-
Dichlorobromomethane	ug/l	<1	-	<5	-	<5	-	<5	-	<5	-
Trichlorofluoromethane	ug/l	<1	-	<5	-	<5	-	<5	-	<5	-
Dichlorodifluoromethane	ug/l	<1	-	<5	-	<5	-	<5	-	<5	-
Chlorodibromomethane	ug/l	<1	-	<5	-	<5	-	<5	-	<5	-
Tetrachloroethylene	ug/l	<1	-	<5	-	<5	-	<5	-	<5	-
Toluene	ug/l	<1	-	<5	-	<5	-	<5	-	<5	-
Trichloroethylene	ug/l	<1	-	<5	-	<5	-	<5	-	<5	-
Chloroethylene	ug/l	<1	-	<10	-	<10	-	<10	-	<10	-
Xylene	ug/l	<1	-	NR	-	NR	-	NR	-	<1.0	-
Base Neutral Extractables:											
Naphthalene	ug/l	NR	-	NR	-	NR	-	NR	-	NR	-
Acid Extractable Organics:											
4-Nitrophenol	ug/l	NR	-	NR	-	NR	-	NR	-	NR	-
2,4-Dimethylphenol	ug/l	NR	-	NR	-	NR	-	NR	-	NR	-

(a)NA = not available.

(b)NR = not requested.

(c)NN = not measured.

(d)Duplicate results reported.

(e)Checked for phenols.

(f)Detected various unknown compounds.

(g)Also detected cyclic hydrocarbons.

(h)Found unidentified organics (alkanes) (boiling point around nonane and octane).

(i)Detection level elevated to 15 ug/l due to the presence of methylene chloride in the method blank.

Source: PADER and ESC files.

AR300067

TABLE 2.18
PHYSICAL AND CHEMICAL DATA FOR
GROUND WATER MONITORING WELL NO. 4

PARAMETER	UNIT	6/4/84		10/16/84		1/17/85		4/17/85		7/17/85		11/18/85		2/10/86		4/23/86		7/24/86	
		ESC	PADER	ESC	PADER	ESC	PADER	ESC	PADER	ESC	PADER	ESC	PADER	ESC	PADER	ESC	PADER	ESC	PADER
Field Tests:																			
Water Level(a)	ft below top of PVC casing	11.1	-	14.3	-	11.8	-	9	-	11.5	-	14.8	-	12	-	11.9	-	12.1	-
Estimated Flow	l/hr	NA(b)	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-	NA	-
pH	pH units	6.35	-	6.15	-	6.30	-	6.10	-	6.25	-	5.7	-	7.00	-	5.85	-	6.45	-
Specific Conductance @ 25°C	umhos/cm	850	-	800	-	700	-	700	-	780	-	NM	-	650	-	600	-	600	-
Temperature	°C	17	-	10	-	2	-	8	-	11	-	8.5	-	6	-	12	-	14	-
Laboratory Tests:																			
pH	pH units	6.80	6.6	6.70	6.60	6.70	7.0	6.90	-	6.72	-	6.3	-	6.20	-	5.9	-	6.40	-
Specific Conductance @ 25°C	umhos/cm	800	757	650	673	750	740	750	-	760	-	700	-	700	-	700	-	700	-
Aluminum	mg/l	NR(c)	8.84	NR	NR(d)	18	140.3	1.0	-	3.3	-	1.3	-	0.1	-	<0.1	-	<0.1	-
Antimony	mg/l	<0.1	-	<0.1	NR	0.4	NR	<0.1	-	<0.1	-	0.2	-	0.3	-	<0.1	-	<0.1	-
Arsenic	mg/l	0.03	0.01	0.009	0.01	0.040	0.042	<0.001	-	<0.001	-	<0.001	-	0.001	-	0.002	-	<0.001	-
Beryllium	mg/l	<0.01	-	<0.01	NR	<0.01	0.022	<0.01	-	<0.010	-	<0.010	-	0.01	-	<0.01	-	<0.01	-
Cadmium	mg/l	<0.01	0.001	0.03	0.02	0.03	0.018	0.03	-	<0.01	-	<0.01	-	<0.01	-	0.02	-	<0.01	-
Chromium	mg/l	0.02	0.03	<0.01	0.01	0.01	0.138	0.01	-	0.02	-	<0.01	-	0.01	-	0.02	-	<0.01	-
Copper	mg/l	0.02	0.02	0.07	0.01	0.05	0.095	0.01	-	0.03	-	<0.01	-	<0.01	-	0.02	-	<0.01	-
Iron	mg/l	NR	12.6	NR	NR	16	229.9	<0.1	-	3.5	-	1.1	-	0.1	-	0.1	-	<0.1	-
Lead	mg/l	<0.010	0.022	<0.01	0.01	0.09	0.09	<0.01	-	0.07	-	0.03	-	<0.01	-	<0.01	-	<0.01	-
Manganese	mg/l	NR	1.06	NR	NR	2.7	3.27	0.49	-	1.4	-	0.34	-	0.3	-	0.28	-	0.28	-
Mercury	mg/l	<0.0005	-	0.002	NR	<0.0005	0.002	0.0006	-	<0.0005	-	<0.0005	-	<0.0005	-	<0.0005	-	<0.0005	-
Nickel	mg/l	<0.1	0.05	<0.1	NR	0.2	0.023	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-	<0.1	-
Selenium	mg/l	0.08	0.01	0.010	0.01	<0.002	0.006	<0.002	-	<0.001	-	<0.001	-	<0.001	-	<0.001	-	<0.001	-
Sodium	mg/l	NR	45.2	NR	NR	42	0.024	35	-	33	-	31	-	28	-	29	-	27	-
Silver	mg/l	0.01	-	<0.01	NR	<0.01	0.005	<0.01	-	<0.01	-	<0.01	-	<0.01	-	<0.01	-	0.01	-
Thallium	mg/l	<0.005	-	<0.010	NR	<0.010	NR	<0.010	-	<0.010	-	<0.010	-	<0.010	-	<0.010	-	<0.010	-
Zinc	mg/l	0.07	0.13	0.09	NR	1.13	1.44	0.44	-	0.07	-	0.86	-	0.03	-	0.03	-	0.03	-
Total Organic Carbon(e)	mg/l	8/7	11.7	4/4	NR	45/68	NR	7.0/6.9	-	13/13	-	5.9/5.7	-	9	-	5	-	6	-
Total Organic Halogen(e)	mg/l as Cl	0.143/0.136	-	0.087/0.095	NR	0.170/0.170	NR	0.058/0.054	-	0.130/0.150	-	0.108/0.110	-	0.160/0.170	-	0.200	-	0.150	-
Sulfate	mg/l	NR	30.0	NR	25.0	36	31	36	-	47	-	22	-	27	-	26	-	17	-
Chloride	mg/l	NR	88.0	NR	88.0	70	98	74	-	82	-	68	-	23	-	63	-	16	-
Phenolics	mg/l	1.15	0.001(f)	<0.01	<0.01(f)	<0.01	NR	<0.01	-	<0.01	-	<0.01	-	0.01	-	0.01	-	<0.01	-
Polychlorinated Biphenyls	mg/l	<0.001	-	<0.001	-	<0.001	NR	<0.001	-	<0.001	-	NR	-	NR	-	NR	-	NR	-
Volatiles Organics (Purgeables):																			
Acrolein	ug/l	<1	(g)	<100	(h)	<100	(i)	<100	-	<100	-	<100	-	<100	-	<100	-	<100	-
Acrylonitrile	ug/l	<1	-	<100	-	<100	-	<100	-	<100	-	<100	-	<100	-	<100	-	<100	-
Benzene	ug/l	<1	-	<100	1.0	<100	-	<100	-	<100	-	<100	-	<100	-	<100	-	<100	-

See footnotes at end of table.

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TABLE 2.18
(Continued)

PARAMETER	UNIT	ESC	6/4/84 PADR	ESC	10/1/84 PADR	ESC	1/17/85 PADR	ESC	4/17/85 PADR	SAMPLING DATE	11/8/85 ESC	2/10/86 ESC	4/25/86 ESC	7/24/86 ESC
Volatile Organics (Purgeables):														
Carbon Tetrachloride	ug/l	<1	-	<5	-	<5	-	<5	-	7/17/85	<5	<5	<5	<5
Chlorobenzene	ug/l	<1	-	<5	-	<5	-	<5	-	7/17/85	<5	<5	<5	<5
1,2-Dichloroethane	ug/l	<1	-	<5	41.0	<5	-	<5	-	7/17/85	<5	<5	<5	<5
1,1,1-Trichloroethane	ug/l	<1	-	<5	-	<5	-	<5	-	7/17/85	<5	<5	<5	<5
1,1-Dichloroethane	ug/l	<1	-	<5	-	<5	-	<5	-	7/17/85	<5	<5	<5	<5
1,1,2-Trichloroethane	ug/l	<1	-	<5	-	<5	-	<5	-	7/17/85	<5	<5	<5	<5
1,1,2,2-Tetrachloroethane	ug/l	<1	-	<5	-	<5	-	<5	-	7/17/85	<5	<5	<5	<5
Chloroethane	ug/l	<1	-	<10	-	<10	-	<10	-	7/17/85	<10	<10	<10	<10
2-Chloroethylvinyl Ether	ug/l	<1	-	<10	-	<10	-	<10	-	7/17/85	<10	<10	<10	<10
Chloroform	ug/l	<1	-	<5	-	<5	-	<5	-	7/17/85	<5	<5	<5	<5
1,1-Dichloroethylene	ug/l	<1	-	<5	-	<5	-	<5	-	7/17/85	<5	<5	<5	<5
Trans-1,2-Dichloroethylene	ug/l	<1	3.1	<5	3.3	<5	2.8	<5	-	7/17/85	<5	<5	<5	<5
1,2-Dichloropropane	ug/l	<1	-	<5	-	<5	-	<5	-	7/17/85	<5	<5	<5	<5
1,2-Dichloropropylene	ug/l	<1	-	<5	-	<5	-	<5	-	7/17/85	<5	<5	<5	<5
Ethylbenzene	ug/l	<1	-	<5	-	<5	-	<5	-	7/17/85	<5	<5	<5	<5
Methylene Chloride	ug/l	3	-	<5	-	<5	-	<5	-	7/17/85	<5	12	<5	<5
Methyl Chloride	ug/l	<1	-	<10	-	<10	-	<10	-	7/17/85	<10	<10	<10	<10
Methyl Bromide	ug/l	<1	-	<10	-	<10	-	<10	-	7/17/85	<10	<10	<10	<10
Bromoform	ug/l	<1	-	<5	-	<5	-	<5	-	7/17/85	<5	<5	<5	<5
Dichlorodimethane	ug/l	<1	-	<5	-	<5	-	<5	-	7/17/85	<5	<5	<5	<5
Trichlorofluoromethane	ug/l	<1	-	<5	-	<5	-	<5	-	7/17/85	<5	<5	<5	<5
Dichlorodifluoromethane	ug/l	<1	-	<5	-	<5	-	<5	-	7/17/85	<5	<5	<5	<5
Chlorodibromomethane	ug/l	<1	-	<5	-	<5	-	<5	-	7/17/85	<5	<5	<5	<5
Tetrachloroethylene	ug/l	<1	-	<5	1.1	<5	-	<5	-	7/17/85	<5	<5	<5	<5
Toluene	ug/l	<1	-	<5	-	<5	-	<5	-	7/17/85	<5	<5	<5	<5
Trichloroethylene	ug/l	3	3.2	<5	2.9	<5	2.3	<5	-	7/17/85	<5	<5	6	<5
Chloroethylene	ug/l	<1	-	<10	-	<10	-	<10	-	7/17/85	<10	<10	<10	<10
Xylene	ug/l	<1	-	NR	-	NR	-	NR	-	7/17/85	<5	<5	<5	<5
Base Neutral Extractables:														
Naphthalene	ug/l	NR	-	NR	-	<5	-	<5	-	7/17/85	NR	NR	NR	NR
Acid Extractable Organics:														
4-Nitrophenol	ug/l	NR	-	NR	-	<10	-	<10	-	7/17/85	<10	NR	NR	NR
2,4-Dimethylphenol	ug/l	NR	-	NR	-	<10	-	<10	-	7/17/85	NR	NR	NR	NR

(a) Measurements obtained immediately prior to boiling with the exception of 4/17/85 which was measured on sampling date. Boiling occurs three to four days before sampling.

(b) NA = Not available.

(c) NR = Not requested.

(d) NM = Not measured.

(e) Duplicate results reported.

(f) Checked for phenols.

(g) Also detected vinyl chloride <1 ug/l.

(h) Also detected methyl heptenone.

(i) Also detected, 2H azapine-2-one hexahydro 50.0 ug/l, n-octyl phthalate 3.0 ug/l, trace of trimethylbenzene or ethyl methyl benzene, and 2-ethyl hexanol.

(j) Detection level elevated to 15 ug/l due to the presence of methylene chloride in the method blank

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Source: PADR and BSC files.

TABLE 2.19
PHYSICAL AND CHEMICAL DATA FOR
CORNFIELD SEEP

PARAMETER	UNLC	6/4/84 ESC	10/16/84 ESC	PADER	1/17/85 ESC	PADER	4/17/85 ESC	SAMPLING DATE 7/17/85 PADER	11/8/85 ESC	2/11/86 ESC	4/22/86 ESC	7/24/86 ESC(f)
Field Tests:												
Estimated Flow	l/hr	10	1	-	10	-	684	-	1,400	450	NM	NM
pH	pH units	5.85	6.20	-	6.80	-	6.60	-	5.80	7.15	6.45	6.20
Specific Conductance @ 25°C	umhos/cm	140	145	-	150	-	140	-	NM	130	110	300
Temperature	°C	16	11	-	1	-	9	-	6.0	5	14	15
Laboratory Tests:												
pH	pH units	6.60	7.10	6.4	6.65	6.4	6.95	-	6.4	6.0	5.80	7.0
Specific Conductance @ 25°C	umhos/cm	150	125	128	145	150	140	-	150	130	110	290
Aluminum	mg/l	NR(a)	NR	NH(c)	1.0	5.97	0.7	-	<0.1	<0.1	<0.1	<0.1
Antimony	mg/l	<0.1	<0.1	NM	0.2	NM	<0.1	-	0.2	<0.1	<0.1	0.3
Arsenic	mg/l	0.01	<0.001	0.01	0.026	0.01	<0.001	-	<0.001	0.006	<0.001	<0.001
Beryllium	mg/l	<0.01	<0.01	NM	<0.01	0.016	<0.01	-	<0.010	0.01	<0.01	<0.01
Cadmium	mg/l	<0.01	0.01	0.001	<0.01	0.018	0.02	-	<0.01	<0.01	<0.01	<0.01
Chromium	mg/l	0.01	<0.01	0.01	0.01	0.025	<0.01	-	<0.01	0.01	0.01	<0.01
Copper	mg/l	<0.01	<0.01	NM	<0.01	0.012	0.01	-	<0.01	<0.01	0.01	<0.01
Iron	mg/l	NR	NR	NM	3.9	11.6	<0.1	-	<0.1	0.1	0.2	<0.1
Lead	mg/l	<0.010	<0.01	0.01	0.03	0.09	<0.01	-	0.01	<0.01	<0.01	<0.01
Manganese	mg/l	NR	NR	NM	0.17	0.163	<0.01	-	0.05	<0.01	0.03	<0.01
Mercury	mg/l	<0.0005	<0.0005	0.001	<0.0005	0.002	0.0007	-	<0.0005	<0.0005	<0.0005	<0.0005
Nickel	mg/l	<0.1	0.1	NM	<0.1	0.23	<0.1	-	<0.1	<0.1	<0.1	<0.1
Selenium	mg/l	0.02	0.028	0.01	<0.002	0.006	<0.002	-	<0.001	<0.001	<0.001	<0.001
Sodium	mg/l	NR	NR	NM	3.7	2.1	4.2	-	3.1	3.5	2.8	4.5
Silver	mg/l	<0.01	0.02	NM	<0.01	0.005	<0.01	-	<0.01	<0.01	<0.01	0.01
Thallium	mg/l	<0.005	<0.010	NM	<0.010	-	<0.010	-	<0.010	<0.010	<0.010	<0.010
Zinc	mg/l	0.05	0.02	NM	0.13	0.093	0.03	-	0.04	0.03	0.02	<0.01
Total Organic Carbon(b)	mg/l	<1/<1	1/1	NM	1/<1	-	1.6/1.4	-	2.6/2.6	13	<1	<1
Total Organic Halogen(b)	mg/l as Cl	0.085/0.092	0.034/0.034	NM	0.093/0.097	-	<0.020/<0.020	-	0.100/0.094	<0.005/<0.005	0.014	0.023
Sulfate	mg/l	NR	NR	17.5	26	22	30	-	29	32	30	33
Chloride	mg/l	NR	NR	8.0	11	10	9.6	-	4.3	6.7	6.1	3.0
Phenolics	mg/l	0.25	<0.01	<0.01(a)	<0.01	(d)	<0.01	-	<0.01	<0.01	0.06	<0.01
Polychlorinated Biphenyls	mg/l	<0.001	<0.001	-	<0.001	-	<0.001	-	NM	NM	NM	NM
Volatiles Organics (Purgeables):					(e)	(e)						
Acrolein	ug/l	<1	<100	-	<100	-	<100	-	<5	<5	<5	-
Acrylonitrile	ug/l	<1	<100	-	<100	-	<100	-	<5	<5	<5	-
Benzene	ug/l	<1	<5	-	<5	-	<5	-	<5	<5	<5	<5

See footnotes at end of table.

AR3000070

TABLE 2-19
(Continued)

PARAMETER	UNIT	6/4/84 ESC	10/16/84 PADER ESC	1/17/85 PADER ESC	4/17/85 PADER ESC	7/17/85 PADER ESC	11/8/85 PADER ESC	2/10/86 PADER ESC	4/25/86 PADER ESC	7/24/86 PADER ESC
Volatile Organics (Purgeables):										
Carbon Tetrachloride	ug/l	<1	<5	<5	<5	<5	<5	<5	<5	<5
Chlorobenzene	ug/l	<1	<5	<5	<5	<5	<5	<5	<5	<5
1,2-Dichloroethane	ug/l	<1	<5	<5	<5	<5	<5	<5	<5	<5
1,1,1-Trichloroethane	ug/l	<1	<5	<5	<5	<5	<5	<5	<5	<5
1,1-Dichloroethane	ug/l	<1	<5	<5	<5	<5	<5	<5	<5	<5
1,1,2-Trichloroethane	ug/l	<1	<5	<5	<5	<5	<5	<5	<5	<5
1,1,2,2-Tetrachloroethane	ug/l	<1	<5	<5	<5	<5	<5	<5	<5	<5
Chloroethane	ug/l	<1	<10	<10	<10	<10	<10	<10	<10	<10
2-Chloroethylvinyl Ether	ug/l	<1	<10	<10	<10	<10	<10	<10	<10	<10
Chloroform	ug/l	<1	<5	<5	<5	<5	<5	<5	<5	<5
1,1-Dichloroethylene	ug/l	<1	<5	<5	<5	<5	<5	<5	<5	<5
Trans-1,2-Dichloroethylene	ug/l	<1	<5	<5	<5	<5	<5	<5	<5	<5
1,2-Dichloropropane	ug/l	<1	<5	<5	<5	<5	<5	<5	<5	<5
1,2-Dichloropropylene	ug/l	<1	<5	<5	<5	<5	<5	<5	<5	<5
Ethylbenzene	ug/l	<1	<5	<5	<5	<5	<5	<5	<5	<5
Methylene Chloride	ug/l	4	<5	<5	<5	180	<5	<5	<5	<5
Methyl Chloride	ug/l	<1	<10	<10	<10	<10	<10	<10	<10	<10
Methyl Bromide	ug/l	<1	<10	<10	<10	<10	<10	<10	<10	<10
Bromoform	ug/l	<1	<5	<5	<5	<5	<5	<5	<5	<5
Dichlorobromomethane	ug/l	<1	<5	<5	<5	<5	<5	<5	<5	<5
Trichlorofluoromethane	ug/l	<1	<5	<5	<5	<5	<5	<5	<5	<5
Dichlorodifluoromethane	ug/l	<1	<5	<5	<5	<5	<5	<5	<5	<5
Chlorodibromomethane	ug/l	<1	<5	<5	<5	<5	<5	<5	<5	<5
Tetrachloroethylene	ug/l	<1	<5	<5	<5	<5	<5	<5	<5	<5
Toluene	ug/l	<1	<5	<5	<5	<5	<5	<5	<5	<5
Trichloroethylene	ug/l	<1	<5	<5	<5	<5	<5	<5	<5	<5
Chloroethylene	ug/l	<1	<10	<10	<10	<10	<10	<10	<10	<10
Xylene	ug/l	<1	NR	NR	NR	NR	<5	<5	<5	<5
Base Neutral Extractables:										
Naphthalene	ug/l	NR	NR	NR	NR	NR	NR	NR	NR	NR
Acid Extractable Organics:										
4-Nitrophenol	ug/l	NR	NR	NR	NR	NR	NR	NR	NR	NR
2,4-Dimethylphenol	ug/l	NR	NR	NR	<10	NR	NR	NR	NR	NR

(a) NR = not requested.

(b) Duplicate results reported.

(c) NR = not measured.

(d) Checked for phenols.

(e) Analyzed for volatiles, none were found.

(f) First time sample collected at this location. The cornfield seep normally collected was dry.

Source: PADER and ESC files.

AR300071

TABLE 2.20
PHYSICAL AND CHEMICAL DATA FOR
OAK TREE SHED

PARAMETER	UNITS	6/4/84 ESC	6/4/84 PADER	10/16/84 ESC	1/17/85 ESC	4/17/85(a) ESC PADER	7/17/85(a) ESC	11/8/85 ESC	2/10/86 ESC	4/25/86 ESC	7/24/86 ESC
Field Tests:											
Estimated Flow	l/hr	10	NH(d)	NO	NO	NA(b)	170	700	340	NH	NH
pH	pH units	6.65	NH	FLOW	FLOW	6.30	5.80	5.6	7.40	6.35	6.20
Specific Conductance @ 25°C	umhos/cm	500	NH			160	180	NH	260	300	300
Temperature	°C	18	NH			10	13	10.5	5	12	15
Laboratory Tests:											
pH	pH units	6.95	6.80			6.90	6.80	5.5	6.7	6.5	6.90
Specific Conductance @ 25°C	umhos/cm	550	491			175	206	400	270	345	340
Aluminum	mg/l	NR(c)	0.05			0.4	0.4	<0.1	0.7	<0.1	<0.1
Antimony	mg/l	<0.1	-			<0.1	<0.1	0.3	0.2	0.4	0.3
Arsenic	mg/l	0.02	0.01			<0.001	<0.001	<0.001	0.010	<0.001	0.001
Beryllium	mg/l	<0.01	NH			<0.01	<0.010	<0.010	0.01	<0.01	<0.01
Cadmium	mg/l	0.01	0.001			0.02	<0.01	<0.01	<0.01	<0.01	<0.01
Chromium	mg/l	0.01	0.01			<0.01	0.03	<0.01	0.01	<0.01	<0.01
Copper	mg/l	0.01	0.01			0.02	0.04	<0.01	<0.01	<0.01	<0.01
Iron	mg/l	NR	5.01			<0.1	0.4	0.8	1.5	0.2	<0.1
Lead	mg/l	<0.010	0.001			<0.01	<0.01	0.01	0.03	<0.01	<0.01
Manganese	mg/l	NR	7.33			0.02	0.67	3.5	1.1	0.10	0.89
Mercury	mg/l	<0.0005	NH			0.0006	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Nickel	mg/l	<0.1	0.01			0.1	<0.1	0.1	<0.1	<0.1	<0.1
Selenium	mg/l	0.04	0.01			<0.002	<0.001	<0.001	<0.001	<0.001	<0.001
Sodium	mg/l	NR	24.4			4.8	2.8	11	11	15	15
Silver	mg/l	0.01	NH			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Thallium	mg/l	<0.005	NH			<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Zinc	mg/l	0.04	0.01			0.24	0.05	0.01	0.03	0.01	<0.01
Total Organic Carbon(e)	mg/l	10/10	30			3.9/3.8	2.5/2.5	3.8/3.8	21	3	4.4(e)
Total Organic Halogen(e)	mg/l as Cl	0.960/0.915	NH			0.030/0.030	<0.020/0.020	0.520/0.410	0.180/0.180	0.250	0.20
Sulfate	mg/l	NR	2.0			41	35	160	38	19	13
Chloride	mg/l	NR	27.0			11	16	13	12	2.6	4.5
Phenolics	mg/l	0.67	0.075(f)			<0.01	<0.01	0.01	<0.01	<0.01	<0.01
Polychlorinated Biphenyls	mg/l	<0.001	-			<0.001	<0.001	NH	NH	NH	NH
Volatile Organics (Purgeables):	(g)						(h)				
Acrolein	ug/l	<1	-			<100	<100	<5	<5	7	-
Acrylonitrile	ug/l	<1	-			<100	<100	<5	<5	<5	-
Benzene	ug/l	<1	11			<5	12	<5	<5	<5	<5

See footnotes at end of table.

AR300072

TABLE 2.20
(Continued)

PARAMETER	UNITS	6/4/84	10/16/84	1/17/85	4/17/85(a)	7/17/85(a)	11/8/85	2/10/86	4/25/86	7/24/86
ESG	ESG	PADER	ESG	ESG	PADER	ESG	ESG	ESG	ESG	ESG
Volatile Organics (Purgeables):										
Carbon Tetrachloride	ug/l	<1	-	NO	-	<5	<5	<5	<5	<5
Chlorobenzene	ug/l	<1	-	FLOW	-	<5	<5	<5	<5	<5
1,2-Dichloroethane	ug/l	<1	-	FLOW	-	<5	<5	<5	<5	<5
1,1,1-Trichloroethane	ug/l	<1	-	-	-	<5	<5	<5	<5	<5
1,1-Dichloroethane	ug/l	<1	-	-	-	<5	<5	<5	<5	<5
1,1,2-Trichloroethane	ug/l	<1	-	-	-	<5	<5	<5	<5	<5
1,1,2,2-Tetrachloroethane	ug/l	<1	-	-	-	<5	<5	<5	<5	<5
Chloroethane	ug/l	<1	-	-	-	<5	<5	<5	<5	<5
2-Chloroethylvinyl Ether	ug/l	<1	-	-	-	<5	<5	<5	<5	<5
Chloroform	ug/l	<1	-	-	-	<5	<5	<5	<5	<5
1,1-Dichloroethylene	ug/l	<1	-	-	-	<5	<5	<5	<5	<5
Trans-1,2-Dichloroethylene	ug/l	8	12.5	-	-	<5	<5	<5	<5	<5
1,2-Dichloropropane	ug/l	<1	37	-	20.4	<5	<5	<5	8	<5
1,2-Dichloropropylene	ug/l	<1	-	-	-	<5	<5	<5	<5	<5
Ethylbenzene	ug/l	<1	370	-	-	<5	<5	<5	<5	<5
Methylene Chloride	ug/l	4	-	-	-	220	<5	<5	<5	<5
Methyl Chloride	ug/l	<1	-	-	-	<10	<10	<5	<5	<5
Methyl Bromide	ug/l	<1	-	-	-	<10	<10	<5	<5	<5
Bromoform	ug/l	<1	-	-	-	<5	<5	<5	<5	<5
Dichlorobromomethane	ug/l	<1	-	-	-	<5	<5	<5	<5	<5
Trichlorofluoromethane	ug/l	<1	-	-	3.2	<5	<5	<5	<5	<5
Dichlorodifluoromethane	ug/l	<1	-	-	-	<5	<5	<5	<5	<5
Chlorodibromomethane	ug/l	<1	-	-	-	<5	<5	<5	<5	<5
Tetrachloroethylene	ug/l	<1	-	-	-	<5	<5	<5	<5	<5
Toluene	ug/l	<1	-	-	-	5	<5	<5	<5	<5
Trichloroethylene	ug/l	<1	-	-	-	<5	<5	<5	<5	<5
Chloroethylene	ug/l	<1	-	-	-	<10	<10	<5	<5	<5
Xylene	ug/l	<1	-	-	-	NR	<5	<5	<5	<5
Base Neutral Extractables:										
Naphthalene	ug/l	NR	-	-	-	NR	NR	NR	NR	NR
Acid Extractable Organics:										
4-Nitrophenol	ug/l	NR	-	-	-	NR	NR	NR	NR	NR
2,4-Dimethylphenol	ug/l	NR	-	-	-	NR	NR	NR	NR	NR

a) Collected approximately 50 feet from original Oak Tree Seep (dry).

b) NA = Not available.

c) NR = Not requested.

d) NM = Not measured.

e) Duplicate results reported.

f) Checked for phenols.

g) Also found: xylene, methyl pentene, methylcyclohexane, vinyl chloride (3.0 ug/l), methylbenzene (<1 ug/l), and one cyclic alkane.
h) Detected unknown compound, estimated total 10 to 50 ug/l.

Source: PADER and ESG files.

AR3000073

TABLE 2.21
PHYSICAL AND CHEMICAL DATA FOR SURFACE WATER
LOCATION 54-B

PARAMETER	UNITS	9/27/83	6/4/84	10/16/84	1/17/85	4/17/85	7/17/85	11/8/85	2/10/86	4/25/86	7/24/86
		IT	ESC	PADER	ESC	PADER	ESC	ESC	ESC	ESC	ESC
Field Tests:											
Estimated Flow	l/hr	NM(a)	2,000	NM	NM	NM	2,200	2,300	5,700	NM	454
pH	pH units	NM	7.36	NM	NM	NM	7.20	6.40	7.50	6.50	6.50
Specific Conductance @ 25°C	umhos/cm	NM	280	NM	385	NM	300	NM	250	230	290
Temperature	°C	NM	21	NM	12	NM	19	9.5	2	1.5	15
Laboratory Tests:											
pH	pH units	NM	7.80	7.50	7.40	7.50	7.42	7.40	6.90	7.00	7.50
Specific Conductance @ 25°C	umhos/cm	NM	412	288	330	315	322	740	230	260	280
Aluminum	mg/l	0.001/0.001	0.27	NR(c)	NR	NR	0.3	<0.1	0.1	<0.1	<0.1
Antimony	mg/l	<0.001	NM	<0.1	NM	0.5	<0.1	0.4	0.3	0.4	0.2
Arsenic	mg/l	<0.001/0.001	NM	0.01	<0.001	0.004	0.035	<0.001	0.004	0.002	<0.001
Beryllium	mg/l	0.001/0.004	NM	<0.01	<0.01	0.016	<0.010	<0.010	0.01	<0.01	<0.01
Cadmium	mg/l	0.01	0.001	0.001	<0.01	0.018	<0.01	<0.01	0.02	<0.01	<0.01
Chromium	mg/l	NM	0.01	0.01	<0.01	0.025	0.07	<0.01	0.02	<0.01	<0.01
Copper	mg/l	<0.01/0.01	0.01	0.01	<0.01	0.007	0.04	0.01	<0.01	0.02	<0.01
Iron	mg/l	NM	1.02	0.99	NR	7.89	0.9	<0.1	0.2	0.2	<0.1
Lead	mg/l	<0.0002	0.01	0.01	<0.01	0.09	<0.01	0.01	0.01	0.16	<0.01
Manganese	mg/l	0.05	0.41	0.22	NR	0.51	0.31	0.17	0.08	0.16	0.21
Mercury	mg/l	<0.001/0.001	NM	NR	0.002	0.003	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Nickel	mg/l	NM	0.01	0.01	0.1	0.023	0.1	<0.1	<0.1	0.1	<0.1
Selenium	mg/l	<0.001/0.001	NM	0.01	0.024	0.006	<0.001	<0.001	<0.001	<0.001	<0.001
Sodium	mg/l	<0.001	NM	14.0	NR	7.39	11	23	9.0	8.7	11
Silver	mg/l	0.04/0.06	NM	NR	<0.01	0.005	<0.01	<0.01	<0.01	<0.01	<0.01
Thallium	mg/l	<1	NM	<0.005	<0.010	NM	<0.010	<0.010	<0.010	<0.010	<0.010
Zinc	mg/l	0.45	0.02	0.03	0.03	0.076	0.04	<0.01	0.03	<0.01	<0.01
Total Organic Carbon(d)	mg/l as C	NM	2/3	4.6	NR	2.9	9.2/9.5	8.2/8.3	6	2	4
Total Organic Halogen(d)	mg/l	NM	0.064/0.062	NM	0.048/0.045	NM	<0.020/0.020	<0.020/0.020	0.059/0.068	0.078	0.068
Sulfate	mg/l	NM	26	26.0	NR	31	30	120	37	32	25
Chloride	mg/l	NM	29	14.0	NR	20	17	2.9	9.2	9.2	3.0
Phenolics	mg/l	0.04(e)	0.001(e)	0.001(e)	<0.001(e)	0	<0.01	0.01	0.02	0.28	<0.01
Polychlorinated Biphenyls	mg/l	NM	NR	NR	<0.001	NM	<0.001	NM	NM	NM	NM
Volatile Organics (purgeables):											
Acrolein	ug/l	<10	-	-	<100	(g)	<100	<5	<5	<5	-
Acrylonitrile	ug/l	<10	-	-	<100	-	<100	<5	<5	<5	-
Benzene	ug/l	<1.0	-	-	<5	-	8	<5	<5	<5	<5

See footnotes at end of table.

AR300074

TABLE 2.21
(Continued)

PARAMETER	UNITS	9/27/83	6/4/84	10/16/84	1/17/85	4/17/85	7/17/85	11/8/85	2/10/86	4/25/86	7/24/86
		IT	PADER	ESC	PADER	ESC	ESC	ESC	ESC	ESC	ESC
Volatile Organics (Purgeables):											
Carbon Tetrachloride	ug/l	<1.0	-	<5	-	<5	<5	<5	<5	<5	<5
Chlorobenzene	ug/l	<1.0	-	<5	-	<5	<5	<5	<5	<5	<5
1,2-Dichloroethane	ug/l	<1.0	1.1	<5	-	<5	<5	<5	<5	<5	<5
1,1,1-Trichloroethane	ug/l	<1.0	-	<5	-	<5	<5	<5	<5	<5	<5
1,1-Dichloroethane	ug/l	<1.0	-	<5	-	<5	<5	<5	<5	<5	<5
1,1,2-Trichloroethane	ug/l	<1.0	-	<5	-	<5	<5	<5	<5	<5	<5
1,1,2,2-Tetrachloroethane	ug/l	<1.0	-	<5	-	<5	<5	<5	<5	<5	<5
Chloroethane	ug/l	<1.0	-	<10	-	<10	<10	<10	<5	<5	<5
2-Chloroethoxyvinyl Ether	ug/l	<1.0	-	<10	-	<10	<10	<10	<5	<5	<5
Chloroform	ug/l	<1.0	-	<5	-	<5	<5	<5	<5	<5	<5
1,1-Dichloroethylene	ug/l	<1.0	-	<5	-	<5	<5	<5	<5	<5	<5
Trans-1,2-Dichloroethylene	ug/l	<1.0	1.9	<5	1.8	<5	<5	<5	<5	<5	<5
1,2-Dichloropropane	ug/l	<1.0	-	<5	-	<5	<5	<5	<5	<5	<5
1,2-Dichloropropylene	ug/l	<1.0	-	<5	-	<5	<5	<5	<5	<5	<5
Ethylbenzene	ug/l	<1.0	-	<5	<1	<5	<5	<5	<5	<5	<5
Methylene Chloride	ug/l	<1.0	-	<5	-	<5	16(h)	<5	5	<5	<5
Methyl Chloride	ug/l	<10	-	<10	-	<10	<10	<10	<5	<5	<5
Methyl Bromide	ug/l	<10	-	<10	-	<10	<5	<5	<5	<5	<5
Bromoform	ug/l	<1.0	-	<5	-	<5	<5	<5	<5	<5	<5
Dichlorobromomethane	ug/l	<1.0	-	<5	-	<5	<5	<5	<5	<5	<5
Trichlorofluoromethane	ug/l	<1.0	-	<5	-	<5	<5	<5	<5	<5	<5
Dichlorodifluoromethane	ug/l	<1.0	-	<5	-	<5	<5	<5	<5	<5	<5
Chlorodibromomethane	ug/l	<1.0	-	<5	<1	<5	<5	<5	<5	<5	<5
Tetrachloroethylene	ug/l	<1.0	-	<5	-	<5	<5	<5	<5	<5	<5
Toluene	ug/l	<1.0	-	<5	-	<5	<5	<5	<5	<5	<5
Trichloroethylene	ug/l	<1.0	7.1	<5	2.2	6	<5	<5	<5	<5	<5
Chloroethylene	ug/l	-	-	<10	-	<10	<10	<10	<5	<5	<5
Xylene	ug/l	-	-	NR	-	NR	NR	<5	<5	<5	<5
Base Neutral Extractables:											
Naphthalene	ug/l	-	-	NR	-	NR	NR	NR	NR	NR	NR
Acid Extractable Organics:											
4-Nitrophenol	ug/l	-	-	NR	-	NR	NR	NR	NR	NR	NR
2,4-Dimethylphenol	ug/l	-	-	NR	-	NR	NR	NR	NR	NR	NR

(a)NR = Not Measured.

(b)NA = Not Available.

(c)NR = Not Requested

(d)Duplicate results reported.

(e)Checked for phenols.

(f)No PCBs or pesticides; Trichloroethane 1.8 ug/l.

(g)Two samples taken; one has volatiles present.

(h)Detection level elevated to 15 ug/l due to the presence of methylene chloride in the method blank.

Source: IT, PADER, and ESC files.

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TABLE 2.22
PHYSICAL AND CHEMICAL DATA FOR GROUND WATER
MONITORING WELL NO. 7 (GW-7)
HEARTICA SITE
SARVER, PENNSYLVANIA

PARAMETER	UNITS	SAMPLING DATE									
		9/27/83	6/4/84	10/16/84	1/17/85	4/17/85	7/17/85	11/8/85	2/10/86	4/25/86	7/24/86
Field Tests:		IT	PADER(I)	ESC	PADER	ESC	PADER	ESC	ESC	ESC	ESC
Water Level(a)	ft below top of PVC casing	NH(b)	NH	15.7	NH	15.5	NH	14.1	15	15.5	15.0
Estimated Flow	1/hr	NH	NH	6.35	NH	6.70	NH	6.00	NA	NA	NA
pH	pH units	NH	NH	6.35	NH	6.70	NH	6.00	6.65	6.25	6.50
Specific Conductance @ 25°C	umhos/cm	NH	NH	900	NH	950	NH	850	800	700	710
Temperature	°C	NH	NH	12	NH	0	NH	9	6	13	14
Laboratory Tests:											
pH	pH units	NH	NH	6.85	6.9	6.70	6.9	7.45	6.50	6.10	6.50
Specific Conductance @ 25°C	umhos/cm	NH	NH	650	663	900	890	800	800	800	800
Aluminum	mg/l	NH	NH	NR	NR	NR	21.48	0.4	<0.1	<0.1	<0.1
Antimony	mg/l	<0.001	NR	<0.1	NR	0.4	NR	<0.1	<0.1	<0.1	<0.1
Arsenic	mg/l	0.053	NR	0.022	0.063	0.050	0.009	0.002	0.010	0.015	0.011
Beryllium	mg/l	0.018	NR	<0.01	NR	<0.01	0.016	<0.01	0.01	<0.01	<0.01
Cadmium	mg/l	0.008	0.03	0.004	0.04	0.02	0.018	0.01	0.01	<0.01	<0.01
Cobalt	mg/l	0.051	0.45	<0.01	0.26	<0.01	0.025	0.01	0.01	<0.01	<0.01
Chromium	mg/l	2.13	3.3	0.04	NR	0.01	0.018	0.01	0.01	0.01	<0.01
Copper	mg/l	NR	497.0	NR	NR	50	64.63	5.0	18	22	34
Iron	mg/l	NR	0.40	NR	NR	0.09	0.09	0.02	<0.01	<0.01	<0.01
Lead	mg/l	NR	11.1	NR	NR	5.7	4.92	5.0	5.4	5.9	5.4
Manganese	mg/l	NR	NR	NR	NR	NR	NR	<0.0005	<0.0005	<0.0005	<0.0005
Mercury	mg/l	1.08	2.2	0.1	NR	0.2	0.023	<0.1	<0.1	<0.1	<0.1
Nickel	mg/l	<0.001	NR	0.006	0.01	<0.002	0.008	<0.002	<0.001	<0.001	<0.001
Selenium	mg/l	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Sodium	mg/l	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Silver	mg/l	<0.001	NR	<0.01	NR	<0.01	0.005	<0.01	<0.01	<0.01	<0.01
Thallium	mg/l	<0.001	NR	<0.010	NR	<0.010	NR	<0.010	<0.010	<0.010	<0.010
Zinc	mg/l	4.3	8.6	0.14	0.34	1.52	1.89	0.73	0.03	0.02	0.05
Total Organic Carbon(a)	mg/l	27	NR	19/19	NR	25/25	NR	24/24	51	22	24
Total Organic Halogen(a)	mg/l as Cl	0.59	NR	0.170/0.180	NR	0.930/0.920	NR	0.204/0.210	0.850/0.820	0.790	0.680
Sulfate	mg/l	NR	NR	NR	NR	NR	NR	NR	17	10	18
Chloride	mg/l	NR	NR	NR	NR	NR	NR	NR	4.2	1.0	5.0
Phenolics	mg/l	0.21(E)	NR	0.07	<0.01(E)	0.05	NR	0.07	0.07	0.08	0.05
Polychlorinated Biphenyls	mg/l	0.001	NR	<0.010	NR	<0.002	NR	<0.001	NR	NR	NR
Volatiles Organics (Purgeables):											
Acrolein	ug/l	<100	NR	<100	NR	<100	NR	<100	<5	<5	<5
Acrylonitrile	ug/l	<100	NR	<100	NR	<100	NR	<100	<5	<5	<5
Benzene	ug/l	5107	7.9	12	NR	14	NR	12	<5	<5	<5

See footnotes at end of table.

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TABLE 2.22
(Continued)

PARAMETER	UNITS	9/17/83				6/4/84		10/16/84		1/17/85		4/17/85		7/17/85	11/18/85	2/10/86	4/15/86	7-24-86
		IT	PADER	ESC		PADER	ESC	PADER	ESC	PADER	ESC	PADER	ESC					
Volatile Organics (Purgeables):																		
Carbon Tetrachloride	ug/l	<10	-	<1	-	-	<5	-	<5	-	<5	-	29	<5	<5	<5	<5	<5
Chlorobenzene	ug/l	500	-	<1	-	-	<5	-	<5	-	<5	-	<5	<5	<5	<5	<5	<5
1,2-Dichloroethane	ug/l	<10	3.2	<1	-	-	<5	-	<5	-	<5	-	<5	<5	<5	<5	<5	<5
1,1,1-Trichloroethane	ug/l	130	-	<1	-	-	<5	-	<5	-	<5	-	<5	<5	<5	7	<5	<5
1,1-Dichloroethane	ug/l	<10	-	<1	-	-	<5	-	<5	-	<5	-	<5	<5	<5	<5	<5	<5
1,1,2-Trichloroethane	ug/l	<10	-	<1	-	-	<5	-	<5	-	17	<5	<5	<5	<5	<5	<5	<5
1,1,1,2-Tetrachloroethane	ug/l	340	-	<1	-	-	<5	-	<5	-	<5	-	<5	<5	<5	<5	<5	<5
Chloroethane	ug/l	<10	-	<1	-	-	<10	-	<10	-	<10	-	<10	<10	<5	<5	<5	<5
2-Chloroethylvinyl Ether	ug/l	<10	-	<10	-	-	<10	-	<10	-	<10	-	<10	<10	<5	<5	<5	<5
Chloroform	ug/l	250	-	11	-	-	<5	-	<5	-	<5	-	<5	<5	<5	<5	<5	<5
1,1-Dichloroethylene	ug/l	<10	-	<1	-	-	<5	-	<5	-	<5	-	<5	<5	<5	<5	<5	<5
Trans-1,2-Dichloroethylene	ug/l	<10	-	4	-	-	<5	-	<5	-	<5	-	<5	<5	10	<5	<5	<5
1,2-Dichloropropane	ug/l	<10	-	<1	-	-	<5	-	<5	-	<5	-	<5	<5	<5	<5	<5	<5
1,2-Dichloropropylene	ug/l	-	-	<1	-	-	<5	-	<5	-	<5	-	<5	<5	<5	<5	<5	<5
Ethylbenzene	ug/l	15,700	3,500	5,460	9,000	<5	4,230	5,500	1,700/9,200(1)	1,900	8,400	4,700	2,000	360	1,200	1,800	<5	<5
Methylene Chloride	ug/l	13,100	-	16	-	-	<10	<5	<5	-	<5	<10	8	<5	<5	<5	<5	<5
Methyl Chloride	ug/l	<100	-	<1	-	-	<10	<10	<10	-	<10	<10	<10	<10	<5	<5	<5	<5
Methyl Bromide	ug/l	<100	-	<1	-	-	<10	<5	<5	-	<5	<10	<5	<5	<5	<5	<5	<5
Bromoform	ug/l	<10	-	<1	-	-	<5	<5	<5	-	<5	<5	<5	<5	<5	6	<5	<5
Dichlorobromomethane	ug/l	<100	-	2	-	-	<5	<5	<5	-	<5	<5	<5	<5	<5	<5	<5	<5
Trichlorofluoromethane	ug/l	<100	-	<1	-	-	<5	<5	<5	-	<5	<5	<5	<5	<5	<5	<5	<5
Dichlorodifluoromethane	ug/l	<1.0	-	<1	-	-	<5	<5	<5	-	17	<5	<5	<5	<5	<5	<5	<5
Chlorodibromomethane	ug/l	21,400	-	<1	-	-	<5	<5	<5	-	<5	<5	<5	<5	<5	<5	<5	<5
Tetrachloroethylene	ug/l	24,700	2.4	6	-	-	<5	<5	<5	-	<5	<5	<5	<5	10	<5	<5	<5
Toluene	ug/l	<10	-	5	-	-	<100	<5	<5	-	<5	<5	<5	<5	<5	<5	<5	<5
Trichloroethylene	ug/l	-	-	<1	-	-	<10	<10	<5	-	<10	<10	<10	<5	<5	<5	<5	<5
Chloroethylene	ug/l	-	-	19,300	-	-	6,500	NR	8,900	NR	3,000/11,000(1)	1,500	3,600	1,500	1,500	1,500	840	840
Xylene	ug/l	-	-	-	-	-	-	>2,000	-	-	-	-	-	-	-	-	-	-
Base Neutral Extractables:																		
Naphthalene	ug/l	(n)	-	NR	-	NR	120	NR	100	NR	150	NR	NR	NR	NR	NR	NR	NR
Acid Extractable Organics:																		
4-Nitrophenol	ug/l	-	-	NR	-	NR	-	NR	-	NR	-	NR	NR	NR	NR	NR	NR	NR
2,4-Dimethylphenol	ug/l	-	-	NR	-	NR	60	NR	90	NR	-	NR	NR	NR	NR	NR	NR	NR

(a) Measurements obtained immediately prior to hailing with the exception of 4/17/85 which was measured on sampling date. Hailing occurs three to four days before sampling.

(b) NR = Not measured

(c) NA = Not Available.

(d) NR = Not Requested.

(e) Duplicate results reported.

(f) Checked for phenols.

(g) Also found: xylene, chlorodifluoromethane, and hydrocarbons.

(h) Also found various allyl substituted benzenes, triethyl-cyclohexane, phenylethanone, or methyl ethyl benzene, 1-phenyl-hexanone, methyl 1-H-Indene, 2,3-dihydro-ethyl phenol, 1,4-dichlorobenzene, 2,0 ug/l.

(i) Well sampled at two intervals for adequate sample.

(j) Also found trimethylbenzene and/or ethyl methylbenzene, trimethylcyclohexane.

(k) Detected allyl substituted benzene approximately 3 ug/l, ethyl phenol 100 ug/l.

(l) Two measurements from two samples.

(m) Detection level elevated to 15 ug/l due to the presence of methylene chloride in the method blank.

(n) Plus: 4 ug/l Isophorone, 4.6 ug/l Di-n-butyl phthalate, 2.8 ug/l Bis (2-ethyl hexyl) phthalate, 4 ug/l Benzidine.

Source: IT, PADER, and ESC files.

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TABLE 2.23

AR 300 700

See footnotes at end of table.

TABLE 2.23
(Continued)

PARAMETER	UNITS	10/16/84 VAROS TRIBUTARY		10/16/84 ORRINGER WATER SUPPLY		9/27/83		10/16/84 LITTLE BULL RUN UPSTREAM		9/27/83		10/16/84 LITTLE BULL RUN DOWNSTREAM	
		ESC	PADER	ESC	PADER	IT	PADER	ESC	PADER	IT	PADER	ESC	PADER
Volatile Organics (Purgeables):													
Carbon Tetrachloride	ug/l	<5	(d)	<5	-	<1.0	-	<5	-	-	<1.0	<5	-
Chlorobenzene	ug/l	<5	-	<5	-	<1.0	-	<5	-	-	<1.0	<5	-
1,2-Dichloroethane	ug/l	<5	-	<5	-	<1.0	-	<5	-	-	<1.0	<5	-
1,1,1-Trichloroethane	ug/l	<5	-	<5	-	<1.0	-	<5	-	-	<1.0	<5	-
1,1-Dichloroethane	ug/l	<5	-	<5	-	<1.0	-	<5	-	-	<1.0	<5	-
1,1,2-Trichloroethane	ug/l	<5	-	<5	-	<1.0	-	<5	-	-	<1.0	<5	-
1,1,2,2-Tetrachloroethane	ug/l	<5	-	<10	-	<1.0	-	<5	-	-	<1.0	<5	-
Chloroethane	ug/l	<10	-	<10	-	<1.0	-	<10	-	-	<1.0	<10	-
2-Chloroethylvinyl Ether	ug/l	<10	-	<10	-	<1.0	-	<10	-	-	<1.0	<10	-
Chloroform	ug/l	<5	-	<5	-	<1.0	-	<5	-	-	<1.0	<5	-
1,1-Dichloroethylene	ug/l	<5	-	<5	-	<1.0	-	<5	-	-	<1.0	<5	-
Trans-1,2-Dichloroethylene	ug/l	<5	-	<5	-	<1.0	-	<5	-	-	<1.0	<5	-
1,2-Dichloropropane	ug/l	<5	-	<5	-	<1.0	-	<5	-	-	<1.0	<5	-
1,2-Dichloropropylene	ug/l	<5	-	<5	-	-	-	<5	-	-	-	<5	-
Ethylbenzene	ug/l	<5	-	<5	-	<1.0	-	<5	-	-	<1.0	<5	-
Methylene Chloride	ug/l	<5	-	<5	-	<1.0	-	<5	-	-	1.2	<5	-
Methyl Chloride	ug/l	<10	-	<10	-	<10	-	<10	-	-	<10	<10	-
Methyl Bromide	ug/l	<10	-	<10	-	<1.0	-	<10	-	-	<1.0	<10	-
Bromoform	ug/l	<5	-	<5	-	<1.0	-	<5	-	-	<1.0	<5	-
Dichlorobromomethane	ug/l	<5	-	<5	-	<1.0	-	<5	-	-	<1.0	<5	-
Trichlorofluoromethane	ug/l	<5	-	<5	-	<1.0	-	<5	-	-	<1.0	<5	-
Dichlorodifluoromethane	ug/l	<5	-	<5	-	<10	-	<5	-	-	<10	<5	-
Chlorodibromomethane	ug/l	<5	-	<5	-	<1.0	-	<5	-	-	<1.0	<5	-
Tetrachloroethylene	ug/l	<5	-	<5	-	<1.0	-	<5	-	-	<1.0	<5	-
Toluene	ug/l	<5	-	<5	-	<1.0	-	<5	-	-	<1.0	<5	-
Trichloroethylene	ug/l	<5	-	<5	-	<1.0	-	<5	-	-	<1.0	<5	-
Chloroethylene	ug/l	<10	-	<10	-	-	-	<10	-	-	-	<10	<1

(a) Samples collected on October 16, 1984.

(b) Not Measured.

(c) Not Available.

(d) Data results reported.

(e) Corrected for phenols.

(f) No volatiles.

(g) No PCBs and pesticides.

(h) No VOCs.

(i) Some unknown compounds present.

(j) Questionable.

File: IT, PADER, and ESC files.

TABLE 2.24

PRECLEANUP SURFACE WATER DATA SUMMARY(a)
HRANICA SITE
(mg/l)(b)

PARAMETERS	PEC 1981	FIT 1981	PADER 1981	PADER 1983	IT 1983
<u>Location - Ravine Seep Off Site to East(c)</u>					
Phenol	0.37	0.79	NT(d)		NT
Iron	97	115	0.89	NT	NT
Manganese	2.7	2.53	BD(e)	NT	NT
Mercury	0.033	0.068	BD	NT	NT
Base Neutral (PCB)	1 Peak	No Peak	NT	NT	NT
Trichloro-ethylene	35 ug/l	NT	NT	NT	NT
<u>Location - Oak Tree Seep/Stream</u>					
Iron	0.16	NT	0.30/0.31	2.12	NT
Manganese	0.39	NT	0.38/0.11	2.0	NT
<u>Location - Obringer Spring House, Stream,(f) and Tapwater(g)</u>					
Iron	1.58	NT	0.32/0.2(e)	1.27/0.1(d)/0.2(f)	NT
Manganese	2.25	NT	0.15/<0.01(e)	2.07/<0.02(d)/<0.01(f)	NT
<u>Location - Stream West of Site</u>					
Iron	0.5	NT	NT	NT	NT
Manganese	0.16	NT	NT	NT	NT
<u>Location - Tributary to McDowell Run Upstream/Downstream</u>					
Iron	NT	NT	1.74/1.44	NT	NT
Manganese	NT	NT	0.07/0.44	NT	NT

See footnotes at end of table.

TABLE 2.24
(Continued)

PARAMETERS	PEC 1981	PEC 1981	FIT 1981	PADER 1981	PADER 1983	IT 1983
<u>Location - Little Bull Creek Upstream/Downstream</u>						
Iron	0.87/1.02	NT	NT	NT	1.14	NT
Manganese	0.35/0	NT	NT	NT	0.63	NT
Phenols		NT	NT	NT	NT	0.3
<u>Location - Stream Before Bull Creek East Ravine/Oaktree Ravine</u>						
Iron	1.33/0.31	NT	NT	NT	NT	NT
Manganese	0.36/0.34	NT	NT	NT	NT	NT

(a)Source PEC Report.

(b)mg/l = milligram per liter.

(c)Indicates two sampling points.

(d)NT indicates samples were not analyzed.

(e)BD indicates samples were below detection limit.

(f)Obringer Stream.

(g)Obringer tap water.

TABLE 2.25
POSTCLEANUP SURFACE WATER DATA SUMMARY(a)
HRANICA SITE

DATE SOURCE/SAMPLING DATE

ESC

PADER

PARAMETER	UNIT	6/4/84	10/16/84	1/17/85	4/17/85	7/17/85	11/8/85	2/10/86	4/25/86	7/24/86	6/4/84	10/16/84	1/17/85	4/17/85
Location - Cornfield Seep														
Cadmium	mg/l(b)	BD(d)	BS(e)	BD	0.02	BD	BD	BD	BD	BD	NT(c)	0.001	0.018	NT
Iron	mg/l	NT	NT	3.9	BD	0.4	BD	BS	BS	BD	NT	NT	11.6	NT
Manganese	mg/l	NT	NT	0.17	BD	0.05	BD	BD	BS	BD	NT	NT	0.163	NT
Selenium	mg/l	0.02	0.028	BD	BD	BD	BD	BD	BD	BD	NT	0.01	BS	NT
Phenolics	mg/l	0.25	BD	BD	BD	BD	BD	BD	0.06	BD	NT	BD	BS	NT
Methylene chloride	ug/l(f)	4	BD	BD	BD	180	BD	6	BD	BD	NT	NT	BD	BD
Location - Oak Tree Seep														
Cadmium	mg/l	.01	NT	NT	0.02	BD	BD	BD	BD	BD	BS	NT	NT	NT
Iron	mg/l	NT	NT	NT	BD	0.4	0.8	1.5	BS	BD	5.01	NT	NT	NT
Manganese	mg/l	NT	NT	NT	BS	0.67	3.5	1.1	0.1	0.89	7.33	NT	NT	NT
Phenolics	mg/l	0.67	NT	NT	BD	BD	BS	BD	BD	BD	BS	NT	NT	NT
1,1,2,2-Tetrachloroethane	ug/l	ND	NT	NT	BD	5	BD	BD	BD	BD	BD	NT	NT	BD
Trans-1,2-dichloroethylene	ug/l	8	NT	NT	BD	BD	BD	BD	BD	BD	12.5	NT	NT	BD
1,2-dichloropropane	ug/l	BD	NT	NT	58	BD	BD	10	8	BD	370	NT	NT	20.4
Ethylbenzene	ug/l	BD	NT	NT	BD	55	BD	BD	BD	BD	37.0	NT	NT	BD
Methylene Chloride	ug/l	4	NT	NT	BD	220	BD	BD	BD	BD	BD	NT	NT	BD
Trichlorofluoroethane	ug/l	BD	NT	NT	9	BD	BD	BD	BD	BD	BD	NT	NT	3.2
Location SW-H Downgradient at Landfill Behind Hranica Residence														
Iron	mg/l	NT	NT	3.7	BS	0.9	BD	BS	BS	BD	.99	NT	7.89	NT
Manganese	mg/l	NT	NT	0.54	BS	0.31	BS	BS	BS	BS	0.22	NT	0.54	NT
Phenolics	mg/l	0.33	BS	BD	BD	BD	BS	BS	0.28	BD	BD	BD	BD	NT
Trans-1,2-dichloroethylene	ug/l	2	BD	BD	BD	BD	BD	BD	BD	BD	1.9	1.8	3.2	NT
Methylene Chloride	ug/l	4	BD	BD	BD	16	BD	BD	BD	BD	7.1	BD	BD	NT
Trichloroethylene	ug/l	8	BD	BD	6	BD	BD	BD	BD	BD	7.1	2.2	6.3	NT
Location - Obinger Water Supply														
Selenium	mg/l	BS	0.025	BS	BS	BD	NT	NT	NT	NT	BS	BS	BS	NT
Location - Seep Sample Below Well No. 7														
Iron	mg/l	NT	NT	NT	NT	NT	BD	2.6	BS	BD	NT	NT	NT	NT
Manganese	mg/l	NT	NT	NT	NT	NT	0.17	0.23	0.09	0.22	NT	NT	NT	NT
Location - Little Bullcreek Run - Upstream/Downstream														
Selenium	mg/l	NT	0.022/0.034	NT	NT	NT	ND	NT	NT	NT	NT	NT	NT	NT

(a) Data source, ESC and PADER monitoring results.
 (b) mg/l milligram per liter or parts per million (ppm).
 (c) "NT" indicates samples were not analyzed.
 (d) BD indicates samples were below detection limits.
 (e) BS indicates samples were below U.S. EPA drinking water standards.
 (f) ug/l micrograms per liter or parts per billion (ppb).

AP-300082

TABLE 2.26
PRECLEANUP GROUND WATER DATA SUMMARY(a)
HRANICA SITE

DATA SOURCE/SAMPLING DATE						
PADER 1981						
PARAMETER	UNIT	APR 1981	NOV 1981	PEC-1982	IT-1983	PADER-1983
<u>Location - Precision Grounding</u>						
<u>Upstairs Sink</u>						
Iron	mg/l(b)	0.88	0.92	NT(c)	NT	NT
Manganese	mg/l	0.15	0.14	NT	NT	NT
<u>Location - Pajer Basin</u>						
Manganese	mg/l	NT	12.7	NT	NT	NT
<u>Location - Slightly West of</u>						
<u>Ravine Seeps</u>						
Iron	mg/l	NT	NT	3.44	NT	NT
Toluene	ug/l(f)	NT	NT	1.0	NT	NT
Bis-ethylhexyl Phthalate	ug/l	NT	NT	76	NT	NT
1,3-Dichlorobenzene	ug/l	NT	NT	40	NT	NT
<u>Location - Slightly South of Ravine</u>						
<u>Seeps</u>						
Iron	mg/l	NT	NT	2.44	NT	NT
<u>Location - West End of Old Municipal</u>						
<u>Landfill (Monitoring Well GW-1)</u>						
Phenol	mg/l	NT	NT	0.22	0.21	NT
Arsenic	mg/l	NT	NT	BD(d)	0.053	NT
Manganese	ug/l	NT	NT	BD	NT	11.1
Iron	mg/l	NT	NT	BS(e)	NT	497
Lead	mg/l	NT	NT	0.22	0.4	1.6
Mercury	mg/l	NT	NT	0.0032	BD	NT
Chromium	mg/l	NT	NT	BS	0.05	0.45
Benzene	ug/l	NT	NT	2	5,700	7.9
Bromoform	ug/l	NT	NT	2	BD	BD
Carbon Tetrachloride	ug/l	NT	NT	2	BD	BD
Chlorodibromo methane	ug/l	NT	NT	2	BD	BD
Chloroform	ug/l	NT	NT	1	250	BD
1,1-dichloroethylene	ug/l	NT	NT	1	BD	BD
1,3-dichloropropylene	ug/l	NT	NT	1	BD	BD
Tetrachloroethylene	ug/l	NT	NT	2	21,400	BD
Toluene	ug/l	NT	NT	4	24,700	2.4
1,2-Trans-dichloroethylene	ug/l	NT	NT	2	BD	BD
1,1,1-trichloroethane	ug/l	NT	NT	1	130	BD
Trichloroethylene	ug/l	NT	NT	2	BD	BD
1,1,2,2-tetrachloroethane	ug/l	NT	NT	BD	340	BD
2,4-dimethyl phenol	ug/l	NT	NT	20	BD	BD
Methylene chloride	ug/l	NT	NT	BD	13,100	BD
Ethylbenzene	ug/l	NT	NT	BD	15,700	3,500
Naphthalene	ug/l	NT	NT	400	45	BD
<u>Location - Monitoring Well GW-3</u>						
Copper	ug/l	NT	NT	NT	1.10	NT
Vinyl chloride	ug/l	NT	NT	NT	5.1	-
Benzene	ug/l	NT	NT	NT	3.4	14
Dichloroethene	ug/l	NT	NT	NT	11	NT
Methylenechloride	ug/l	NT	NT	NT	3.6	NT
Ethyl benzene	ug/l	NT	NT	NT	11	10
Toluene	ug/l	NT	NT	NT	9.8	42

(a)Source PEC 1982 Report, IT and PADER data.

(b)mg/l = milligrams per liter or parts per million (ppm).

(c)"NT" indicates samples were not analyzed.

(d)BD indicates samples were below detection limit.

(e)BS indicates samples were below U.S. EPA drinking water standards.

(f)ug/l = micrograms per liter or parts per billion (ppb).

AR300083

TABLE 2.27
POSTCLEANUP GROUND WATER DATA SUMMARY(a)
BRANICA SITE

DATE SOURCE/SAMPLING DATE

ESC

PADER

PARAMETER	UNIT	6/4/84	10/16/84	1/17/85	4/17/85	7/17/85	11/8/85	2/10/86	4/25/86	7/24/86	6/4/84	10/16/84	1/17/85	4/17/85
Location - Monitoring Well GW-3														
Cadmium	mg/l(b)	BD(c)	0.02	0.02	0.03	0.1	BD	BD	BD	BD	BS(d)	0.03	0.018	NT(e)
Iron	mg/l	NT	NT	BS	BD	6.4	BD	BS	BS	BD	16.2	NT	72.18	NT
Manganese	mg/l	NT	BD	1.2	0.83	1.5	1.4	0.75	0.71	0.73	1.56	NT	2.89	NT
Phenolics	mg/l	0.3	BD	BD	BD	BD	BD	BD	0.48	BS	BS	BD	NT	NT
1,2-dichloroethane	ug/l(d)	BD	BD	BD	BD	BD	BD	BD	BD	BD	BD	1.0	NT	NT
Trans-1,2-dichloroethylene	ug/l	1	BD	BD	BD	BD	BD	BD	BD	BD	1.3	4.3	3.2	2.7
Ethylbenzene	ug/l	BD	BD	BD	BD	BD	BD	BD	BD	BD	1.2	BD	NT	NT
Methylene chloride	ug/l	3	BD	BD	BD	15	BD	6	BD	BD	NT	NT	NT	NT
Trichloroethylene	ug/l	BD	BD	BD	BD	BD	BD	BD	BD	BD	NT	NT	1.3	NT
Location - Monitoring Well GW-4														
Cadmium	mg/l	BD	0.03	0.03	0.03	BD	BD	BD	0.02	BD	BS	0.02	0.018	NT
Iron	mg/l	NT	NT	16	BD	3.5	1.1	BS	BS	BD	12.6	NT	229.9	NT
Lead	mg/l	BD	BD	0.09	BD	0.07	BD	BD	BD	BD	BS	BS	0.09	NT
Manganese	mg/l	NT	NT	2.7	0.49	1.4	0.54	0.3	0.28	0.28	1.06	NT	3.27	NT
Phenolics	mg/l	1.15	BD	BD	BD	BD	BD	BS	BS	BD	BS	BD	NT	NT
Benzene	ug/l	BD	BD	BD	BD	BD	BD	BD	BD	BD	BD	1.0	NT	NT
Trans-1,2-dichloroethylene	ug/l	BD	BD	BD	BD	BD	BD	BD	BD	BD	3.1	3.3	2.8	NT
Methylene Chloride	ug/l	3	BD	BD	BD	BD	BD	12	BD	BD	NT	NT	NT	NT
Trichloroethylene	ug/l	3	BD	BD	BD	BD	BD	BD	6	BD	3.2	2.9	2.3	NT
Location - Monitoring Well GW-7														
Arsenic	mg/l	BS	BS	0.05	BS	BS	BS	BS	BS	BS	BS	0.063	BS	NT
Chromium	mg/l	BS	BD	BD	BS	0.05	BD	BS	BD	BD	BS	0.26	BS	NT
Iron	mg/l	NT	NT	50	5.0	4.0	53	18	22	34	62.8	NT	64.6	NT
Lead	mg/l	0.2	0.1	0.09	BD	0.37	BS	BD	BD	BD	0.21	1.64	0.09	NT
Manganese	mg/l	0.63	NT	5.7	6.2	7.1	5.0	5.4	5.9	5.4	5.14	NT	4.9	NT
Phenolics	mg/l	12.0	0.07	0.05	0.07	BD	0.05	0.07	0.08	0.05	0.125	BD	BD	NT
Benzene	ug/l	4	BD	14	BD	12	BD	BD	BD	BD	BD	BD	BD	NT
Carbon tetrachloride	ug/l	BD	BD	BD	BD	29	BD	BD	BD	BD	BD	BD	BD	NT
1,1,1-trichloroethane	ug/l	BD	BD	BD	BD	BD	BD	7	BD	BD	NT	NT	NT	NT
1,1,2-trichloroethane	ug/l	BD	BD	BD	17	BD	BD	BD	BD	BD	NT	NT	NT	NT
Chloroform	ug/l	11	BD	BD	BD	BD	BD	BD	BD	BD	NT	NT	NT	NT
Trans-1,2-dichloroethylene	ug/l	4	BD	BD	BD	BD	BD	10	BD	BD	NT	NT	NT	NT
Ethylbenzene	ug/l	5,460	BD	5,500	1,900	1,200	4,700	2,000	360	1,800	9,000	4,230	1,700	8,400
Methylene chloride	ug/l	16	BD	BD	BD	17	BD	8	BD	BD	NT	NT	NT	NT
Chlorodibromomethane	ug/l	BD	BD	BD	17	BD	BD	BD	BD	BD	NT	NT	NT	NT
Toluene	ug/l	6	BD	BD	BD	BD	BD	10	BD	BD	NT	NT	NT	NT
Xylene	ug/l	19,300	> 2,000	NT	NT	5,000	1,500	3,600	1,500	840	NT	6,500	8,900	3,000
Naphthalene	ug/l	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	120	100	150
Dimethyl phenol	ug/l	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	60	90	NT

(a) Data source, ESC and PADER monitoring results.

(b) mg/l = milligram per liter or parts per million (ppm).

(c) BD indicates samples were below detection limits.

(d) BS indicates samples were below U.S. EPA drinking water standards.

(e) NT indicates samples were not tested.

(f) mg/l = micrograms per liter or parts per billion (ppb).

TABLE 3.1
RESULTS OF POLYCHLORINATED BIPHENYL (PCB)
ANALYSES OF WIPE SAMPLES

SAMPLE IDENTIFICATION	ug	PCB CONCENTRATION		SOURCE(b) AROCOR
		ug/m ² (a)	% RECOVERY	
Blank	<1.0	--	--	--
#1 Top Tank	24.3/26.6(c)	1050/1150 QC	85.8%(d)	1248
#2 Top Tank	31.3	1350	(b)	1248
#3 Vat No. 5	128	5500	(b)	1254
#4 Vat No. 5	37.1	1600	(b)	1254
#5 Vat No. 3	10.7	460	(b)	1254
#6 Vat No. 3	49.2	2100	(b)	1254

(a)Reported values were not corrected for percent recovery; ug/m² = micrograms per square meter.

(b)Indicates when PCBs are detected, the source of the PCB contamination and the commerical aroclor mixture used for quantitation. All samples were screened for Aroclors 1016, 1221, 1232, 1242,1248, 1254, 1260, 1262, and 1268 to determine whether PCBs were present and which aroclor standards were required for instrument calibration.

(c)The indicated sample was analyzed in duplicate.

(d)Value represents the percent recovery for spiking with Aroclor 1248.

Source: D'Appolonia files

AR300085

TABLE 4.1
SUMMARY OF LABORATORY TESTING RESULTS
CLAY CAP MATERIAL FOR ASH PILE

SAMPLE NO.	GRAIN SIZE ANALYSIS					DESCRIPTION	ATTERBERG LIMITS			MODIFIED PROCTOR		
	GRAVEL (%)	SAND (%)	SILT (%)	CLAY (%)	CLASSIFICATION (USDA/USCS)		LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	NATURAL WATER CONTENT (%)	OPTIMUM WATER CONTENT (%)	OPTIMUM DRY DENSITY (%)
TP-1	52.3 43.8	17.5 24.0	24.2 32.2	6.0	Sandy loam(a) GC(b)	Clayey gravel and sand	30.0	20.0	10.0	18.0	10.2	125.4
TP-2	68.1 62.6	19.9 23.3	10.6 14.1	1.4	Sand(a) GM(b)	Silty gravel and sand	NP(c)	NP	NP	10.2	9.1	128.8
TP-3	47.0 41.3	39.8 44.2	10.7 14.5	2.5	Loamy sand(a) GM-SM(b)	Silty gravel and sand	NP	NP	NP	9.1	11.4	125.3
TP-4	14.5 8.4	44.5 46.8	36.0 44.8	5.0	Sandy loam(a) SC-SM(b)	Clayey silt sand and trace of gravel	21.0	17.0	4.0	15.2	10.7	125.9
TP-5	61.6 57.7	22.4 25.4	9.0 16.9	7.0	Loamy sand(a) GM(b)	Silty gravel and sand	NP	NP	NP	15.0	9.6	125.5
TP-6	50.4 46.3	26.6 29.1	28.8 24.6	4.2	Sandy loam(a) SC	Silty gravel and sand	NP	NP	NP	13.1	9.3	122.5
TP-7	3.8 1.0	52.0 53.3	33.8 45.7	10.4	Sandy loam(a) SC	Silty clay and sand	34.0	21.0	13.0	18.2	11.7	126.3
TP-8	39.7 25.3	16.7 30.1	34.7 44.6	9.0	Sandy loam(a) SC(b)	Clay and sand with some fine gravel	34.0	23.0	11.0	17.6	11.0	122.3

(a)U.S. Department of Agriculture soil classification.

(b)Unified Soil Classification System.

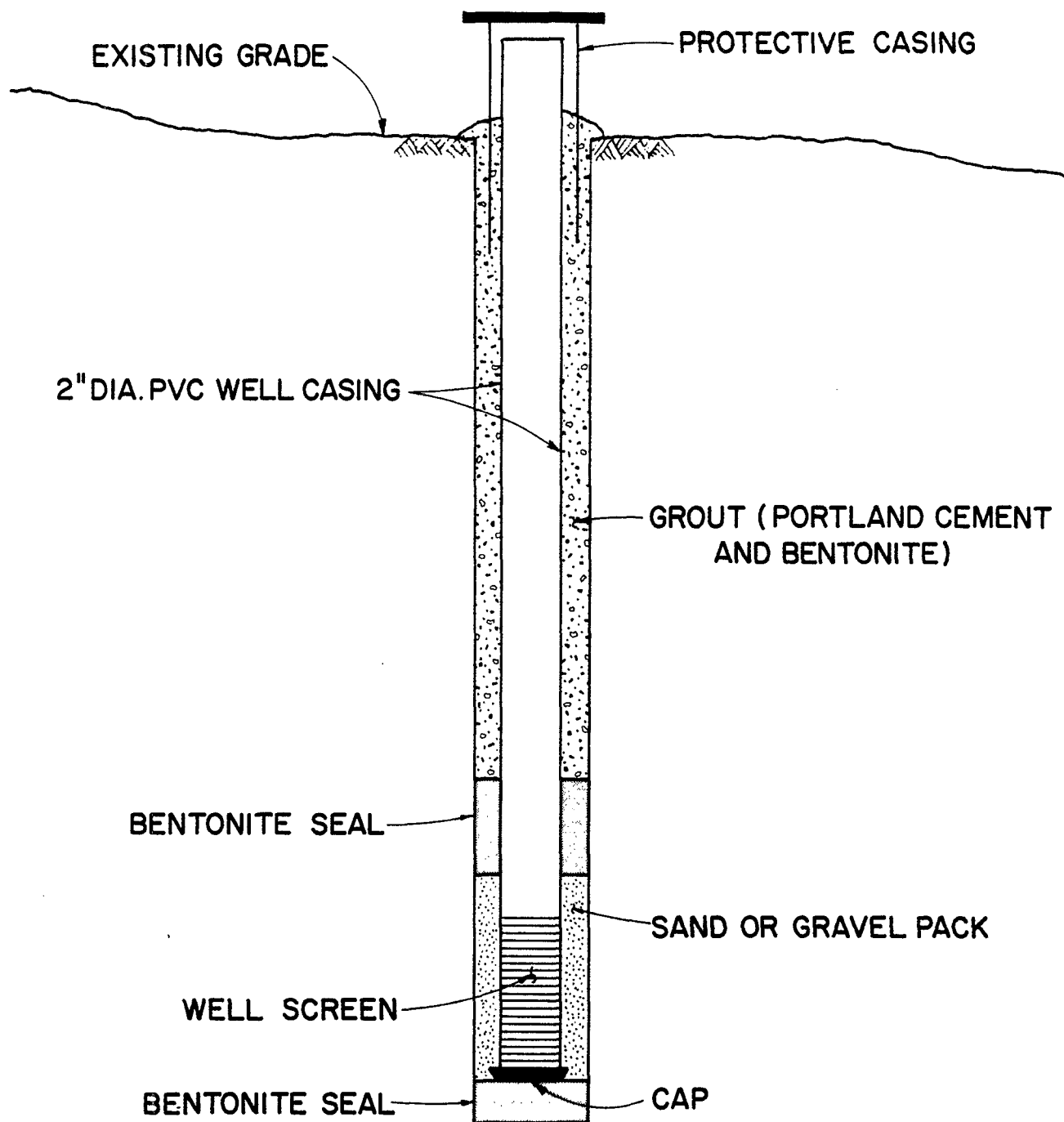
(c)NP = Nonplastic material.

Source: D'Appolonia files.

AR300087

APPENDIX A
LIST OF FIGURES AND DRAWINGS

AR300088



BRUN 135 38748

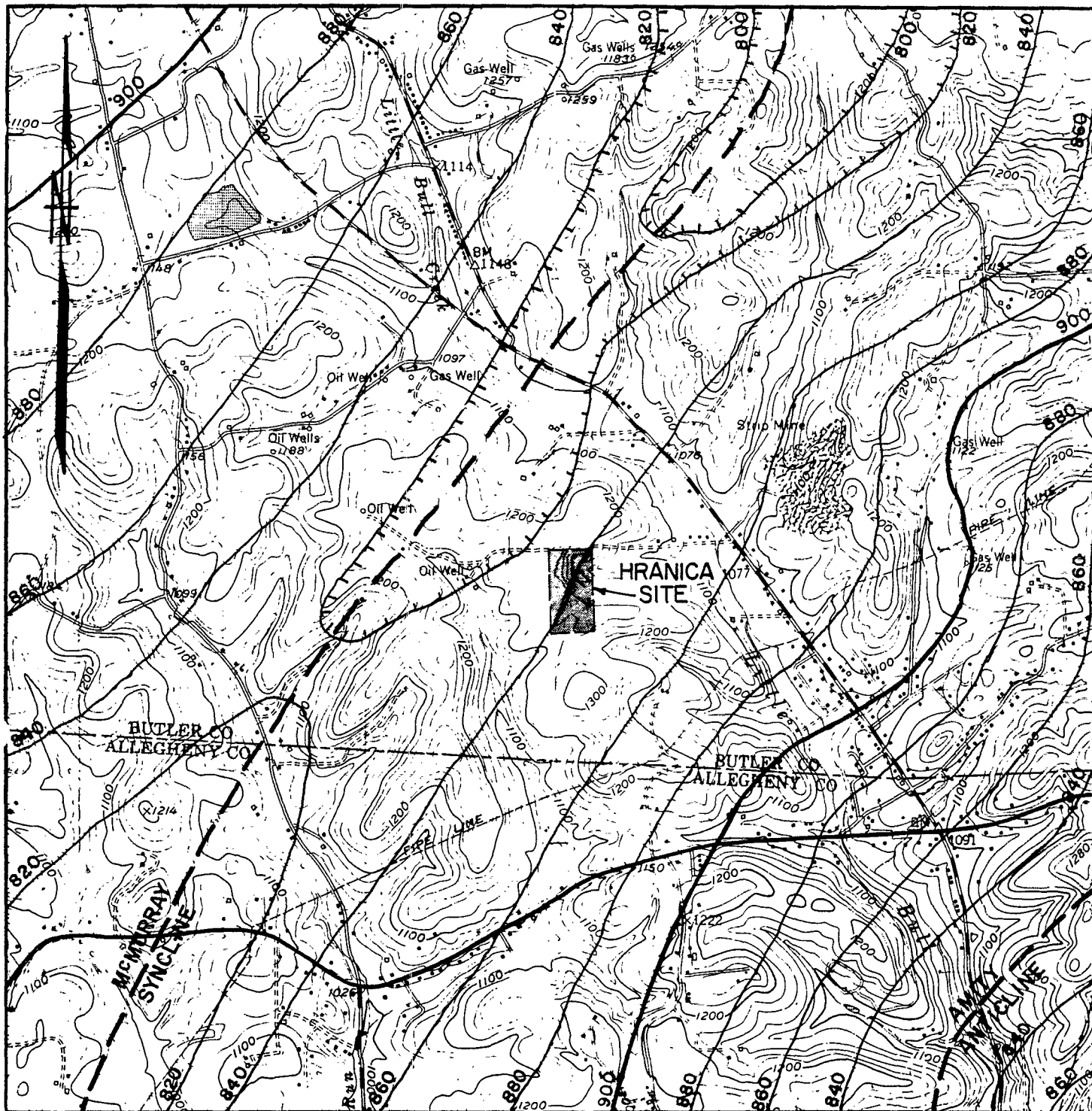
PENN ENVIRONMENTAL CONSULTANTS, INC.
 ENGINEERS • CONSULTANTS • LABORATORIES
 PITTSBURGH, PENNSYLVANIA 15220

AR 3000090

DRAWN	DATE	SCALE
rth	4-82	NONE

FIGURE 2-1

PPG INDUSTRIES, INC.
 HRANICA SITE
WELL CONSTRUCTION DETAIL
 BUFFALO TOWNSHIP, BUTLER COUNTY, PA.



BASE MAP IS A PORTION OF THE CURTISVILLE, PA. AND FREEPORT, PA. QUADRANGLES (7.5 MINUTE SERIES, 1953, PHOTOREVISED 1969) AS PUBLISHED BY THE UNITED STATES DEPARTMENT OF THE INTERIOR AND THE UNITED STATES GEOLOGICAL SURVEY.

LEGEND

- 860 ——— CONTOUR AT BASE OF UPPER FREEPORT COAL SEAM
- CENTERLINE OF STRUCTURE

DRAWN	DATE	SCALE
RJD	4-82	1"=2000'

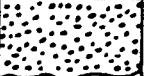



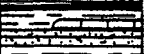

FIGURE 2-2



PENN ENVIRONMENTAL CONSULTANTS, INC.
ENGINEERS • CONSULTANTS • LABORATORIES
PITTSBURGH, PENNSYLVANIA 15220


PPG INDUSTRIES, INC. 0091
HRANICA SITE
UPPER FREEPORT COAL CONTOURS
BUFFALO TOWNSHIP, BUTLER COUNTY, PA.

GENERALIZED GEOLOGIC COLUMN

Thickness in Feet	Group	Formation (Symbol)	Columnar Section	Members, Beds and Other Minor Units
0-150	Monongahela	Qal		Alluvium, glacial outwash, etc.
~ 260		Pittsburgh (Ppg)		Pittsburgh sandstone Pittsburgh coal Upper Pittsburgh limestone
200-400	Conemaugh	Casselman (Pcc)		Lower Pittsburgh limestone Connellsville sandstone Clarksburg limestone Morgantown sandstone Birmingham shale
300-350		300'----- Glenahaw (Pcg) 200'----- 100'-----		Ames limestone Pittsburgh red beds Harlem coal Saltburg sandstone Upper Bakerstown coal Woods Run limestone Lower Bakerstown coal Cambridge (Pine Creek) limestone Buffalo sandstone Brush Creek limestone Brush Creek coal Upper Mahoning sandstone Mahoning coal Lower Mahoning sandstone Upper Freeport coal Upper Freeport limestone Butler sandstone Lower Freeport coal Lower Freeport limestone Freeport sandstone Upper Kittanning coal
~ 90	Allegheny	Freeport (Paf)		Freeport sandstone
~ 110		Kittanning (Pak)		Kittanning sandstone

COLUMN DATA FROM MAP OF GREATER PITTSBURGH RE-
GION THICKNESS OF ROCKS OVER THE UPPER FREEPORT
COAL BY J.L.CRAFT, L.HEYMAN, AND R.G.PIOTROWSKI. PRE-
PREPARED BY THE PENNSYLVANIA
BUREAU OF TOPOGRAPHIC AND GEO-
LOGIC SURVEY (1976).

DRAWN	DATE	SCALE
rth	4-82	
FIGURE 2-3		


PENN ENVIRONMENTAL CONSULTANTS, INC.
 ENGINEERS • CONSULTANTS • LABORATORIES
 PITTSBURGH, PENNSYLVANIA 15220

PPG INDUSTRIES, INC.
HRANICA SITE
GENERALIZED GEOLOGIC COLUMN
 BUFFALO TOWNSHIP, BUTLER COUNTY, PA.

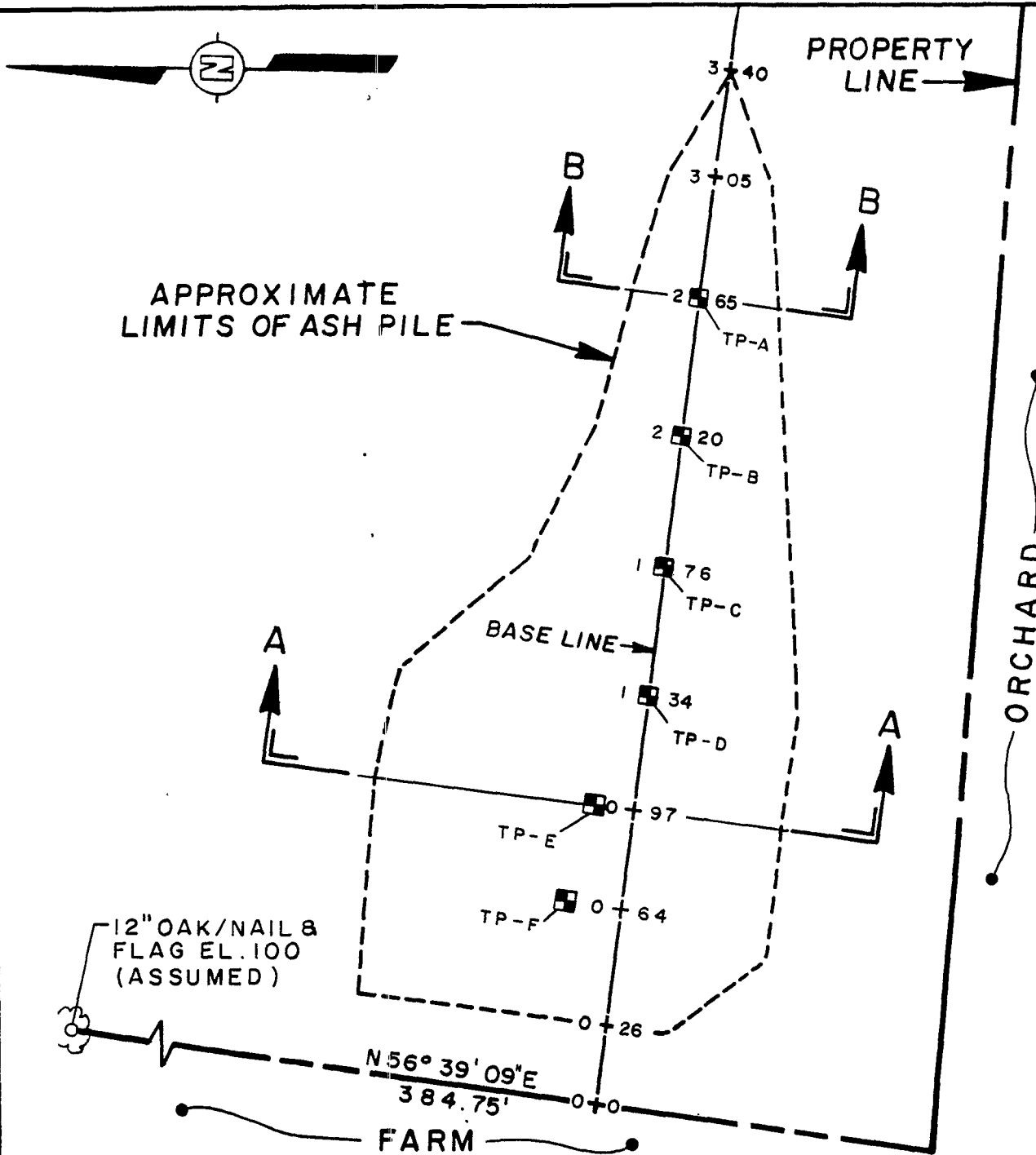


FIGURE 2-4

PLAN OF
ASH DISPOSAL SITE
HRANICA SITE
PREPARED FOR

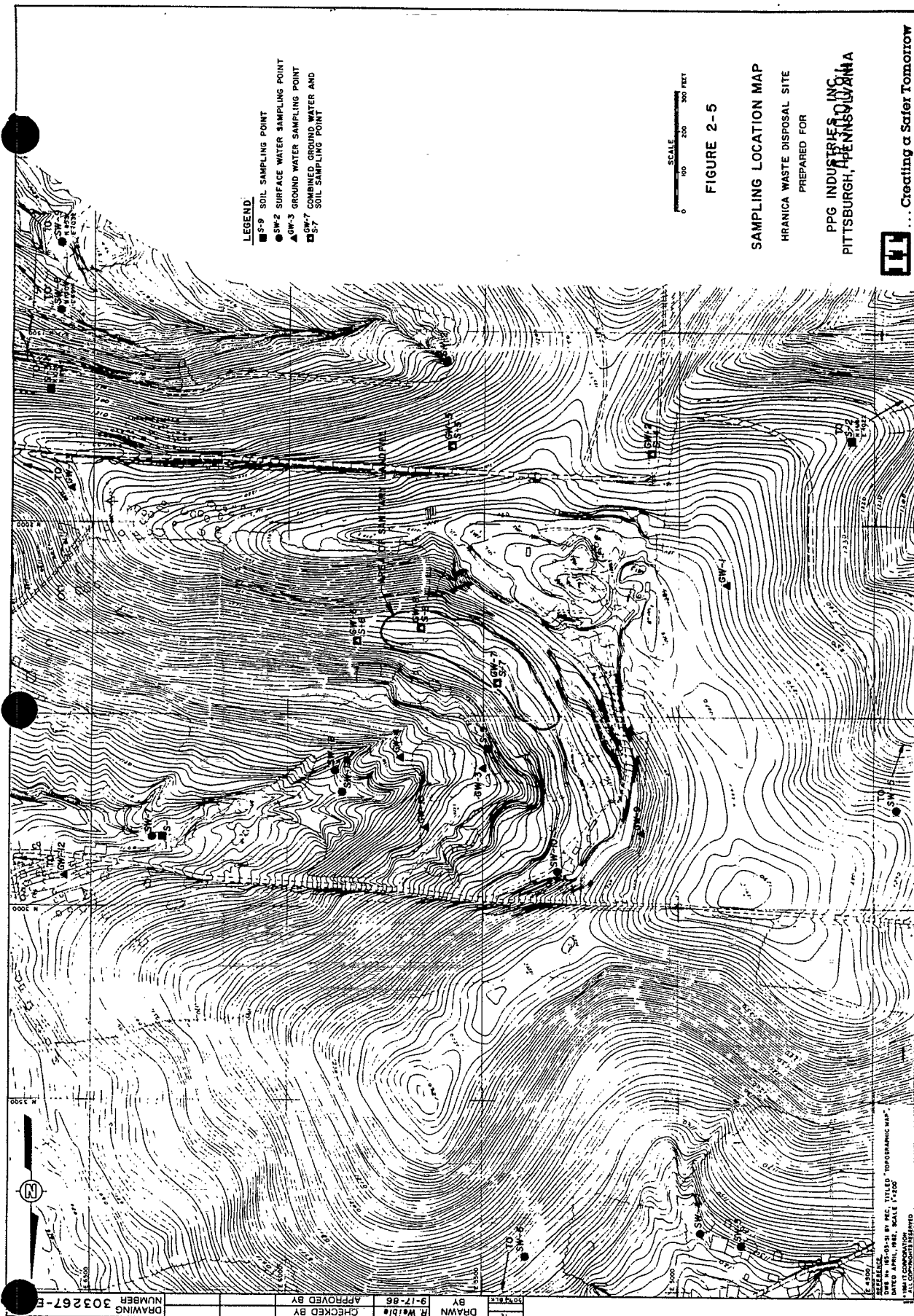
PPG INDUSTRIES, INC.
PITTSBURGH, PENNSYLVANIA

LEGEND:

TEST PIT LOCATION
TP-A



... Creating a Safer Tomorrow



LEGEND

- S-9 SOIL SAMPLING POINT
- SW-2 SURFACE WATER SAMPLING POINT
- ▲ GW-3 GROUND WATER SAMPLING POINT
- ▲ GW-7 COMBINED GROUND WATER AND SOIL SAMPLING POINT
- S-7 SOIL SAMPLING POINT



FIGURE 2-5

SAMPLING LOCATION MAP

HRANCA WASTE DISPOSAL SITE
PREPARED FOR

PPG INDUSTRIES, INC.
PITTSBURGH, PENNSYLVANIA



... Creating a Safer Tomorrow

DRAWING NUMBER 303267-E	CHECKED BY	APPROVED BY	BY 9-17-86	DRAWN R. W. B. 10
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DATE: 10-01-86 BY: PGC, TITLED: "TOPOGRAPHIC MAP"
DATE: APRIL 1982, SCALE: 1"=200'
BY: J. C. B. 10
DATE: 10-01-86 BY: PGC, TITLED: "TOPOGRAPHIC MAP"
DATE: APRIL 1982, SCALE: 1"=200'
BY: J. C. B. 10
DATE: 10-01-86 BY: PGC, TITLED: "TOPOGRAPHIC MAP"
DATE: APRIL 1982, SCALE: 1"=200'
BY: J. C. B. 10

AR300094



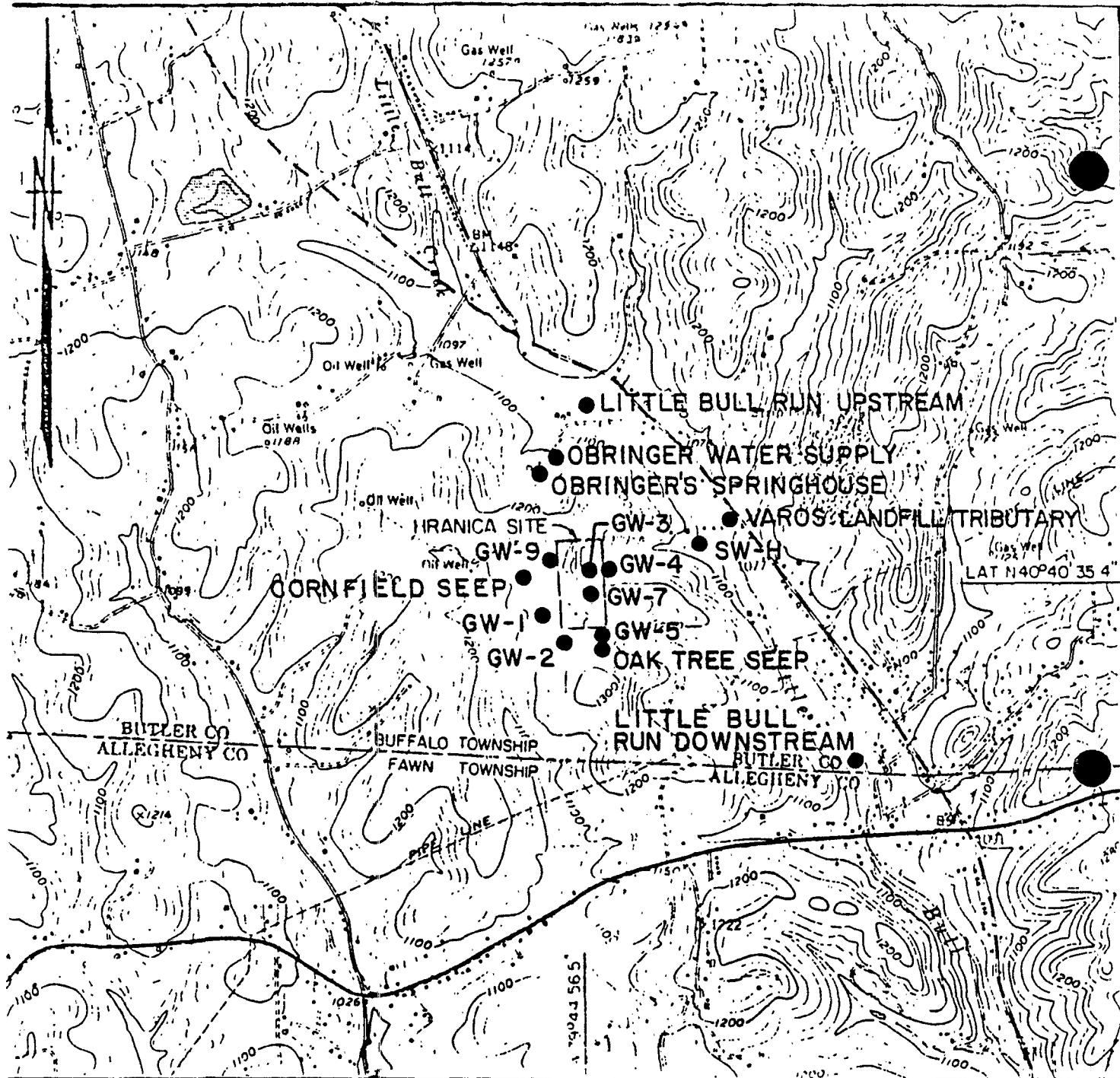
AR300096

Preliminary Fracture Trace
Analyses Prepared by
D'Appolonia/IT

March 19, 1984

Fig. 3-1

83-1344



SCALE - FEET
0 2000 4000

FIGURE 3.2

SAMPLE LOCATION MAP

HRANICA LANDFILL
PPG INDUSTRIES, INC.

REFERENCE

U.S.G.S. 7.5 MIN. TOPOGRAPHIC QUADRANGLES,
CURTISVILLE, PA AND FREEPORT, PA,
DATED 1953, PHOTOREVISED 1969, SCALE
1:24,000.

AR300097



Earth
Sciences
Consultants
inc.

A12300098

APPENDIX B

D'APPOLONIA - TECHNICAL PROPOSAL, WASTE SITE CLEANUP,
HRANICA LANDFILL, SARVER, PENNSYLVANIA
FEBRUARY 1983

AR300099

Project No. X83-0940-P14
Feb 83

D'APPOLONIA

Technical Proposal

Waste Disposal Site Cleanup Hranica Landfill Sarver, Pennsylvania

Inquiry No. 40-866-82-29

PPG Industries, Inc.
Pittsburgh, Pennsylvania

DWAS
CENTRAL FILE

AR300100

Technical Proposal

**Waste Disposal Site Cleanup
Hranica Landfill
Sarver, Pennsylvania**

AR300101

D'APPOLONIA

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LIST OF TABLES

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2	Waste Categories and Additional Testing Requirements
3	Proposed Waste Transportation Subcontractors
4	Proposed Waste Disposal Subcontractors

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<u>FIGURE NO.</u>	<u>TITLE</u>
1	Site Plan
2	Project Schedule

AR300104

1.0 INTRODUCTION

D'Appolonia Waste Management Services, Inc. (D'Appolonia), appreciates the opportunity to submit this proposal to PPG Industries, Inc., Coatings and Resins Division (PPG) for the waste disposal site cleanup at the Hranica abandoned hazardous waste facility near Sarver, Pennsylvania. We have reviewed the Invitation to Bid with Instructions to Bidders (as amended) and reference documents made available by PPG, have carefully inspected the site, and have prepared our proposal to address the requirements of PPG as expressed in the Invitation to Bid. We understand that the purpose of this work is to remove all drummed wastes, empty drums, liquids stored in tanks, visibly contaminated soil, ash residues, certain other contaminated debris, and incineration vats from the site and dispose of these materials in accordance with all applicable federal and state hazardous waste regulations. A further objective is to decontaminate as necessary any tank (or remove and dispose of such tanks if decontamination is not feasible) from which liquid is removed. The project objective does not include removal of empty tanks, junked automobiles, miscellaneous surface and landfilled solid wastes, and debris from the site.

AR300105

2.0 EXISTING SITE CONDITIONS

The purpose of this chapter is to state D'Appolonia's understanding of existing site conditions as the basis for our technical work plan and bid price. Information was gathered from the reference documents made available by PPG and a thorough site inspection.

2.1 BACKGROUND

During the period 1966 through 1974, the Hranica site was used for the disposal of industrial wastes generated by the PPG Springdale, Pennsylvania facility and the Alcoa metals manufacturing facility at Logans Ferry, Pennsylvania. The PPG wastes consisted primarily of paints, coatings, resins, and solvents, and the Alcoa wastes were principally comprised of plating wastes, metal sludges, pastes, and powders. Prior to the use of the site by PPG and Alcoa, the site owner had accepted household refuse and possibly other wastes (e.g., domestic and industrial) for placement in an on-site landfill.

At the Hranica site, wastes were burned in incineration pits and vats or ignited directly in the drum containers. The ash residue from the burning operation was then dumped on the ground surface. When regulatory officials would no longer allow burning of the wastes, these materials were left intact or spilled onto the ground surface.

The majority of the wastes currently stored at the Hranica site are classified as hazardous under Resource Conservation and Recovery Act (RCRA) regulations as follows:

- PPG sludges include specifically listed wastes.
- PPG off-spec paints and resins may be ignitable and/or fail the EP toxicity test due to the presence of heavy metals.
- Alcoa aluminum paste wastes may be reactive with water.

AR300106

For purposes of this proposal, D'Appolonia will handle all wastes at the site as hazardous, with the exception of drums that meet the RCRA definition of empty containers (40 CFR 261.7). Visibly contaminated soil, ash residue, tank liquids, and potentially contaminated debris (e.g., wood materials) will likewise be managed as hazardous wastes. Steel tanks and other potentially contaminated metal surfaces will be decontaminated, as necessary, at the site.

2.2 WASTE INVENTORY

As part of the development of this proposal, D'Appolonia prepared a comprehensive inventory of the drums of waste on the ground surface at the Hranica site. Table 1 provides an inventory of these waste containers relative to the following:

- Labeling
- Size
- Condition
- Suspected or observed contents.

A total of 14,736 drums was counted at the Hranica site by D'Appolonia personnel. Two experienced field engineers/surveyors independently counted all drums in each of 32 distinct areas of the site.

The majority of drums (60 percent) are painted or labeled as having originated from PPG, whereas 19 percent have marking indicating they were generated by Alcoa. Approximately 2,560 drums (17 percent) were not labeled or too badly deteriorated to make a positive determination; about 650 drums (4 percent) were identified as originating from sources other than PPG or Alcoa.

About 3,910 of the drums at the site are currently empty (per RCRA definition). Most of the drums that contain materials appear to be at least partially full; many (31 percent) remain intact.

Of the drums which currently contain wastes, more than 8,000 are full or partially full of solids and sludges. It is estimated that about five

AR300107

percent of the nonempty drums contain liquids. Much of the liquid appears to be rainwater that has collected in leaking and open-top drums. Some liquid oil in drums has been observed.

AR300108

3.0 WORK PLAN

This chapter D'Appolonia's technical and management plans to conduct the scope of work requested by PPG. Figure 1 presents our proposed site plan which identifies site facilities.

3.1 INFRASTRUCTURE DEVELOPMENT

The infrastructure required to execute project tasks will be developed and implemented prior to the hazardous waste handling operations. The infrastructure is designed to achieve the following:

- Provide a safe work site for personnel both inside and outside the site boundaries.
- Provide environmental controls so that contamination is not spread while accomplishing the remedial action program.
- Provide facilities so that production and schedule objectives can be met for the range of uncertainty for the waste material to be removed.

Figure 1 shows a preliminary plan of the site facilities at the Hranica site and work zones based on this plan. The final locations and orientation of facilities will be established prior to the start of work based on further discussions with PPG and the review of preparedness and contingency plans by the Pennsylvania Department of Environmental Resources (DER).

3.1.1 Site Access

3.1.1.1 Site Access Roadway

Access to the Hranica site will be via Hranica Drive and the existing entry lane. The western portion of Hranica Drive will need to be upgraded to allow passage of off-site transportation and, if necessary, emergency vehicles. The improvements to this roadway will include grading to provide a smoother surface and the placement of crushed slag to form a firm driving surface. The upgrading will be required for approximately 750 feet of this roadway.

AR300109

D'Appolonia will protect the existing roadway and underlying steel pipes at the two crossings of Little Bull Creek. Protective measures will include placing a layer of coarse slag on the roadway in these locations and laying heavy timber beams atop the slag base to span each crossing; the beams will bear on timber cross beams at each end. Coarse slag will also be used to ramp up to the timbers. D'Appolonia will prepare any necessary Pennsylvania DER waterways obstruction permit for this roadway protection.

3.1.1.2 Interior Roadways

The existing roadways at the site provide access to each of the areas in which wastes have been deposited (Figure 1). The main site roadway will be realigned and graded to allow vehicle and equipment passage; secondary roadways will be maintained to provide access required for the cleanup operations and fulfill the access requirements of the preparedness plan.

3.1.2 Work Areas

In accordance with the preliminary site plan, the Hranica site is defined as consisting of three distinct work zones as follows:

- Contaminated zone - The area in which the waste materials will be handled in their present locations and placed in staging areas.
- Neutral zone - The area in which personnel, equipment, and vehicles will be decontaminated.
- Site safety zone - The area in which the site facilities are located and the probability of contamination minimal.

Distinct administrative controls will be applied to each site zone. During operations, these zones will be clearly marked with flagging.

3.1.2.1 Clearing and Leveling of Work Areas

Clearing and grading of the Hranica site will be limited to that necessary to create sufficient working room for waste handling and removal.

AR300110

truck load out, and ancillary facilities. During site preparation, vegetation in the facilities areas (Figure 1) will be cut and disposed either by burning (after receipt of applicable permit) or in a sanitary landfill. Miscellaneous debris which congests work areas will be moved aside. Our work plan is designed to minimize the amount of handling of debris which is not considered to be contaminated. Potentially contaminated debris will be decontaminated (as in the case of metal surfaces) or, if unable to be cleaned (as in the case of wood materials), treated as a bulk solid hazardous waste.

3.1.2.2 Staging Area

A drummed waste handling and staging area will be developed at the site near the present location of the Hranica residence (Figure 1). In this area, drums of liquid wastes will be repackaged, as necessary, and prepared for off-site shipment. Repackaging or transfer of liquid drum contents will not be performed outside this designated area. The staging area will be cleared and graded and the ground surface will be overlain with thin plastic sheeting and sand and gravel. A small earthen berm will be constructed around the perimeter of this area as a spill control provision.

3.1.3 Fire and Safety Provisions

Waste handling operations under this contract will require work in a potentially hazardous environment so that adequate provisions must be made to protect the health and safety of all site personnel and visitors. In addition, much of the wastes originally received at the Hranica site was flammable material so that special consideration must be given to prevention and control of fire. Before the initiation of waste handling operations, detailed preparedness and contingency plans will be developed and submitted for review and acceptance by PPG and the Pennsylvania DER.

AR300111

3.1.3.1 Fire Prevention and Control

The following provisions will be made to prevent and/or control fires during the conduct of the work at the Hranica site:

- Portable dry chemical fire extinguishers with each work crew and in the facilities area at the site.
- Two-way radio communication between the work crews and the site office and external telephone communication from the site office.
- Prohibition of smoking or open flames in work areas.
- Coordination with local fire-fighting companies and posting of emergency telephone numbers at the site office.
- Use of nonsparking hand tools to the extent practicable.
- Storage of fuel for the construction equipment away from waste handling areas.
- Monitoring of air quality to detect excessive levels that could lead to fires and/or explosions.
- Training of personnel in fire prevention and emergency response procedures.

No routine on-site welding or cutting is planned. In the event such activity is required, the D'Appolonia site manager will work with the welders to ensure it is performed in a safe manner.

3.1.3.2 Worker Health and Safety Protection

The hazardous environmental protection program for all personnel working or visiting at the site will include the following components:

- Medical surveillance
- Employee training
- Personnel protection program supported by air quality monitoring

AR300112

- Personnel service facilities
- Emergency provisions.

A trained health and safety officer will be present on site to implement the health and safety program.

Personnel involved in site activities will be provided with a medical examination before the onset and at the completion of operations. The medical examination will include a complete medical and work history; a physical examination with emphasis on the skin, renal, and hepatic systems; and laboratory examinations to include blood tests for liver and renal functions, a complete blood count, and a urinalysis. In addition, personnel will be medically evaluated prior to the onset of operations for their ability to wear personal respiratory protection and other potentially stressful equipment. This examination will include an evaluation of the cardiorespiratory system and a pulmonary function test.

D'Appolonia will provide occupational hazard training to employees before the commencement of work. This training will consist of the following:

- Acute and chronic effects of hazardous chemicals potentially present at the Hranica site.
- The requirements, effectiveness, and limitations of personal protection equipment.
- Proper use and fitting of respiratory and other protective gear.
- Prohibitions in waste handling areas, including beards, contact lenses, eating, smoking, chewing, and working when ill.
- Appropriate responses to emergency situations.

Follow-up training will be provided for any major changes in operational procedures.

AR300113

Employees working within the potentially contaminated zones of the site will be provided safety equipment and protective clothing. The minimum protective equipment required to be worn by these personnel follows:

- Half-face, air-purifying respirators with organic vapor cartridges.
- Full-body protective coveralls.
- Hard hat.
- Frontal eye protection with impact-resistant lenses.
- Protective steel-toed rubber boots.
- Protective gloves with impermeable palms.

This personal protection equipment is capable of providing protection for those wastes known to be present at the Hranica site in concentrations estimated from the available data. Additional/substitute equipment will be made available if warranted by conditions encountered during project execution. Such equipment includes the following:

- Self-contained breathing apparatus and supplied air respirators.
- Full-face, air-purifying respirators with either front-mounted or back-mounted air intakes.
- Impermeable coveralls and splash aprons.
- High-gauntlet rubber gloves.
- Full-face shields.

To allow continual evaluation of the level of administrative and other protective measures required to provide a safe working environment during site operations, an air quality monitoring program will be employed. This monitoring program will include collection of real-time, semiquantitative data on airborne total organic vapor concentrations in and around the breathing zone of workers. A portable organic vapor analyzer/gas chromatograph (OVA/GC) will be used to collect these data.

AR300T14

Results of this monitoring will be used to effect rapid response to air-borne contaminant levels. Action limits will be established based on interpretation of total organic vapor readings as compared to maximum allowable concentrations of specific contaminants encountered and/or expected at the Hranica site.

Within the site neutral zone (Figure 1), D'Appolonia will provide and maintain clean change rooms, lockers, laundry, lunchroom, and shower facilities for all personnel at the project site. Personnel working in the contaminated zone will be required to remove their outer clothing and wash their face and hands prior to eating, drinking, or smoking in the designated lunch trailer. At the end of the work shift, each person working in a contaminated zone will be required to remove his outer clothing and use the shower facilities before changing into his street clothes and leaving the site. Coveralls will be placed in a hopper and laundered daily at the site. Other health and safety equipment will be placed in employee-designated stalls within a health and safety equipment trailer.

Emergency first-aid equipment to be maintained within the site safety zone includes the following:

- Industrial first-aid kit
- Emergency eye wash station
- Stretcher
- Fire blanket.

At least one person trained in Red Cross first-aid procedures will be present at the site during construction activities. Transportation to and arrangements with local hospitals will be maintained for treatment of any accident victims.

3.1.4 Spill Containment Provisions

In handling contaminated materials at the Hranica site, a continuous effort will be made to prevent and control any spillage of contaminated materials. The spill control program is founded upon the following:

AR300115

- Providing physical controls to the extent possible in areas where such spills are most likely to occur.
- Proceeding in a deliberate and controlled fashion in handling all hazardous materials.
- Providing materials and equipment for immediate response to spills.

The D'Appolonia site manager is responsible for the immediate action in case of a spill. The construction foremen and health and safety officer will also be made aware of the necessary steps to be taken in the event of a spill.

The following areas/activities are considered to be those which present the highest probability of material spillage:

- Handling of deteriorated drums of liquid wastes
- Transfer of liquid wastes to the staging area
- Removal of liquids from storage tanks
- Staging of liquid wastes.

Drainage control features will be incorporated in the staging area to contain any spills of liquid materials that occur in this area (Section 3.1.2.2).

In general, the steps to be taken in the event of a spill of hazardous materials during work at the Hranica site follow:

- Containment - If the spilled material is a liquid, the first reaction is to contain the material to the smallest area practicable. If the amount of liquid material is large, the nearest available construction equipment will be used to construct a small berm around the spill area. If the material spillage is small, soil will be added directly to the spilled material as an absorbent.

AR300116

- Isolation - The area of the spill will be isolated from traffic patterns by responsible persons in the immediate area. Surveyor's flagging on wooden posts or laths will be used to designate the spill area and isolate it from traffic. In no case will the responsible person leave the spill area until steps are implemented for control and cleanup.
- Control - An immediate assessment will be made to determine whether the spilled material presents a fire or airborne gas release problem. If either of these events are of concern, soil or other absorbent will be mixed with the spilled material and/or the area may be covered with a thin plastic sheet or canvas tarpaulin while awaiting cleanup.
- Cleanup - Spilled materials will be mixed with soil and handled as a bulk solid hazardous waste for disposal.

The limit of any liquid spill and the adequacy of cleanup will be determined primarily by visual inspection and, if deemed necessary, soil sampling.

3.1.4.1 Equipment Decontamination

An equipment washdown facility will be constructed in the neutral zone near the site entrance to allow decontamination of transportation vehicles and equipment leaving the contaminated zone (Figure 1). The washdown facility will consist of a concrete slab placed slightly below grade which is curbed and drains to a sump. Equipment will be washed using a high-pressure water spray. Collected wash waters will be disposed off site.

3.1.5 Laboratory Facilities

Because of the proximity of D'Appolonia facilities to the Hranica site, D'Appolonia proposes to use our full-service environmental laboratory in Murrysville, Pennsylvania for the analysis of samples collected during the conduct of the work at the Hranica site. To ensure chain of custody of the samples and rapid turnaround of results, the following procedure will be employed:

AR300117

- Samples collected during the workday will be placed in storage racks together with the field sampling documentation forms.
- The samples and accompanying documentation will be delivered at the end of each workday to D'Appolonia's Murrysville laboratory.
- At the laboratory, field sampling data forms will be reviewed and the samples analyzed during a special night shift.
- Analysis data forms will be completed and attached to a copy of the sampling record.
- The completed analysis data forms and accompanying sampling record will be delivered to the site the following morning.

The staff capabilities, available equipment, special scheduling, and orderly procedures will allow a normal turnaround of 12 to 24 hours for waste characterization testing. Longer turnaround time is required for EP toxicity analysis of solids which requires a 24-hour leaching time prior to testing.

The D'Appolonia environmental laboratory is certified (Laboratory No. 38-120) by the U.S. Environmental Protection Agency (EPA) and the Commonwealth of Pennsylvania for microbiology, inorganic, and organic drinking water analyses. The program annually requires the analysis of EPA control samples for the following parameters:

- | | |
|------------|-------------------|
| ● Arsenic | ● Nitrate |
| ● Barium | ● Fluoride |
| ● Cadmium | ● Endrin |
| ● Chromium | ● Lindane |
| ● Lead | ● Methoxychlor |
| ● Mercury | ● Toxaphene |
| ● Selenium | ● 2,4-D |
| ● Silver | ● 2,4,5-TP silvex |

D'Appolonia has also received a proficiency rating from the National Institute for Occupational Safety and Health (NIOSH) under the Proficiency Analytical Testing (PAT) Program (Laboratory Identification No. 15235001). The PAT program includes analysis of air samples (filters)

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for cadmium, lead, and zinc, and charcoal filters for the following organic compounds:

- Benzene
- Carbon tetrachloride
- Chloroform
- 1,2-dichlorethane
- Methylene chloride
- Methyl chloroform
- Methyl ethyl ketone
- Methyl isobutyl ketone
- p-Dioxane
- Toluene
- Trichloroethylene
- o-Xylene

State-of-the-art instrumentation is utilized in the D'Appolonia laboratory. In addition to the typical wet chemical equipment (e.g., ultraviolet and visible spectrophotometers, fluorometer, ion selective and pH meters, dissolved oxygen meters, and conductivity meters), the following laboratory instrumentation is currently in use:

- Perkin-Elmer 5000 Atomic Absorption Spectrophotometer with graphite furnace (Perkin-Elmer HGA-500) and Perkin-Elmer Model 2380 Atomic Absorption Spectrophotometer with Background Corrector and IL AVA Hydride Generation System. These units, which are used for metal analyses, are completely automated and interfaced directly to our in-house computer for data reduction and storage. The graphite furnace enables much lower detection limits to be achieved than by conventional flame atomization.
- Hewlett-Packard (HP) 5985B Gas Chromatograph/Mass Spectrometer/Data Station (GC/MS/DS) System. This system, which is used for organic compound identification and quantification, comprises a microprocessor controlled HP5840A gas chromatograph interfaced with an HP5985B quadrupole mass spectrometer. The mass spectrometer has a scanning range from 10 to 1,000 atomic mass units and is equipped with both chemical and electron impact ionization sources. Data acquisition and reduction is accomplished by an HP21MX E-Series computer equipped with an HP7920S 70 megabyte disc drive. The software package is designed to provide compound identification and quantification according to the EPA Priority Pollutant Protocol or by the NIH/EPA/MSDC Mass Spectral Data Base containing the mass spectra of 25,560 organic and organometallic compounds.

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- Perkin-Elmer Sigma 1 and Sigma 2 Gas Chromatographs (GC) connected to a Perkin-Elmer Sigma 10/B4 Chromatography Data Station. These units, which are used for organic compound quantification or to determine if selected compounds are present in a sample, have their own data reduction system. The Sigma 1 GC is equipped with an electron capture detector (for halogenated hydrocarbons), a flame ionization detector (for general organics), and a nitrogen/phosphorous detector (for organics containing nitrogen or phosphorus). The Sigma 2 GC is equipped with an electron capture detector, flame ionization detector, and a thermal conductivity detector (for gases, volatile inorganic, and organic compounds). A Chemical Data Systems Pyroprobe 100 pyrolyzer can be attached to either GC or the GC/MS/DS for analysis of polymer and other nonvolatile organic materials. A Hewlett-Packard 7675A Purge and Trap Sampler can also be interfaced with either GC or the GC/MS/DS system for volatile organic compound analyses. A Perkin-Elmer AS-100B Auto-Sampler is available for automatic injection of liquid samples into the GC. This device eliminates manual time-consuming operations and lessens the potential for operator error.
- Hewlett-Packard 5880 Gas Chromatograph with Level IV Data System and Purge and Trap Sample Preparation System. This unit is equipped with dual flame ionization detectors and single electron capture detector.
- Hewlett-Packard 5791A Gas Chromatograph with Tekmar LSC-2 Purge and Trap Device and ALS-1 Automatic Sampler. This unit is equipped with single flame ionization detector and automated purge and trap system. The data system is a Hewlett-Packard 3390 Reporting Integrator.
- Leco SC-32 Sulfur System. This system contains its own data reduction capability and utilizes an infrared (IR) detector for determining sulfur in a variety of sample types which include soil, liquids, and wastes. Sulfur forms are determined by sample pretreatments.
- Oceanography International Model 524 Total Organic Carbon Analyzer. This unit enables total organic carbon (TOC) determinations to be performed on a variety of materials, including water, sediment, soil, and various solvent media.

AR300120

- Oceanography International Model 610 Total Organic Halogen (TOX) Analyzer. This is used for the determination of purgeable and TOX in water and waste samples.
- Apple II Computer System. Both the TOC and TOX analyzers are interfaced with the Apple II Computer System which manages the data from these determinations.

Laboratory balances include a Cahn Model 26 automatic electrobalance, a Sartorius Model 2003 MP1, Mettler Model H33, and Mettler Model H10 analytical balances and a Mettler Model PC4400 top loader balance. These balances are calibrated against NBS certified weights twice a year and maintained under a service contract annually. The D'Appolonia environmental laboratory is also equipped with two Corning Mega-Pure automatic water stills which produce distilled water with a conductivity of less than five micromhos per centimeter at 25 degrees Centigrade. When organic-free water is needed (e.g., for volatile organic analysis), the distilled water is passed through a charcoal column. The organic-free water is then verified by the purge and trap analysis technique on the GC.

3.1.6 Personnel Service Facilities

3.1.6.1 Personnel Decontamination and Associated Facilities

The personnel decontamination facility includes clean change rooms, lockers, laundry, and shower facilities for all personnel at the site. These facilities are contained in a 12- by 60-foot trailer which will be located at the Hranica site. An enclosed van will be located adjacent to the decontamination facility to serve as the health and safety equipment trailer; here, each worker will place his outer protective equipment (excluding coveralls) before eating lunch and at the end of the work shift. A smaller trailer will be parked adjacent to the decontamination facility to serve as a lunchroom. Entrance to the lunchroom will be provided only through the decontamination facility.

AR300121

3.1.6.2 Site Offices

An office trailer will be provided at the site in the safety zone for use by D'Appolonia project personnel and for maintenance of on-site records. Additional trailers will be placed at the site for use as offices by PPG, Alcoa, and Pennsylvania DER personnel.

3.1.6.3 Utilities

Utilities will be provided at the site as follows:

- Telephone - Extension of existing service on Hranica Drive.
- Electric - Extension of existing service on Hranica Drive.
- Water - Trucked in water for most uses; bottled potable water.
- Sewerage - Portable toilets; shower water will be collected in tanks and trucked to a publicly owned treatment works.

3.1.7 Protection of Existing Ground Water Test Wells

The existing ground water test wells at the Hranica site will be protected by the installation of a series of wooden posts driven around each well. Surveyor's flagging will be stretched around these wooden posts to clearly identify each well location.

3.2 WASTE REMOVAL AND MANAGEMENT

The handling of the drummed waste at the Hranica site will be performed in five distinct steps as follows:

- Inspection and sampling
- Characterization and testing
- Repackaging and staging for load out
- Loading and transportation
- Off-site management.

The following paragraph addresses the work to be accomplished in each step.

AR300122

3.2.1 Inspection and Sampling

Work crews under the direction of a field chemist/engineer will inspect the contents of and withdraw samples from accessible drums in each area. Before any waste drum is opened, a preliminary assessment of the drum condition and potential safety hazards will be made. The outside surface of the drum will be inspected, paying particular attention to any labeling or placarding information and noting the condition around the fill and vent ports. All labeling information will be recorded and a code number will be painted on the outside of each drum.

The drum will then be carefully opened for sampling. For an intact container, the preferred method of gaining access for sampling is by opening the vent and/or fill ports with a nonsparking bung wrench or removing the top closure band. If the bung or closure band cannot be removed, the top of the drum will be pierced using a manual deheader or other cutting tool.

After opening, the contents of each drum will be sampled. A sufficient sample volume will be taken for the laboratory characterization and possible subsequent analyses. Samples will be collected in 500 or 1,000 milliliter glass bottles with teflon-lined lids to preclude the escape of volatile components. If the waste contained in the drum is a heterogeneous mixture, the solid and liquid phases will be sampled separately. Liquids will be sampled with a "thieving rod" or similar pipette device. Samples will be examined through the glass rod for immiscible phases or other visual heterogeneities. Solids and sludges will be withdrawn using small hand shovels.

A field sampling data sheet will be completed for each sample which indicates the code number(s) of the drum(s) that correspond to that sample.

AR300123

3.2.2 Characterization and Testing

The laboratory analysis protocol includes preliminary screening of all samples, compositing of like materials, RCRA characterization testing to determine the nature of the waste materials and the potential for bulk-ing of wastes into larger lots of similar materials, further compositing, and more detailed testing (as needed). Upon receipt in the laboratory, each drum sample will be inspected and an evaluation will be made of the identity of the material in relation to other materials encountered; information for general guidance/characterization (e.g., color, texture, viscosity, specific gravity, flammability) will be collected.

After this preliminary screening, composite samples will be formed for basic RCRA classification testing. Drum samples of unique wastes will be tested individually; when groups of drum samples containing apparently identical materials are encountered, composite testing of the contents of this group of drums will be performed. The RCRA characterization tests to be performed are the following:

- pH
- Flash point
- TOX (by Bielstein's copper wire test) as a check for the presence of halocarbons, including polychlorinated biphenyls (PCBs)
- Water solubility
- Water reactivity
- Presence of oxidizers
- Spot check for sulfides (if pH is greater than 3)
- Spot check for cyanide (if pH is greater than 3).

AR300124

Based on results of such testing, the drummed wastes will be categorized according to their physical state and by the waste categories given in Table 2. The additional testing requirements for these wastes are related to manifesting and the potential methods for off-site disposition (Table 2). Additional testing will be performed on composited samples; D'Appolonia estimates that, on the average, one composite sample for additional analyses will represent about 50 original drum samples.

Once the laboratory testing is completed, the results will be returned to the site operations personnel for guidance in further waste handling. It is anticipated that, based on our laboratory capabilities and developed procedures and scheduling (Section 3.1.5), the results of characterization/compatibility testing will be available within 12 to 24 hours of sampling. The availability of results of additional sampling is dependent on the specific analyses performed; for example, EP toxicity analysis involves a 24-hour leaching period so that such data will not be available for approximately 36 to 48 hours after sampling.

3.2.3 Repackaging and Staging

Upon completion of the inspection and testing of the accessible drums in a given area, the processing of waste materials dependent on their composition can begin. This operation will be accomplished with two crews of labor and equipment under the direction of a construction foreman. The construction equipment to be utilized includes all-terrain forklifts, a rubber-tired front-end loader, and a backhoe fitted with a drum grapppler. D'Appolonia intends to minimize the amount of drum repackaging required both for economic and health and safety reasons.

All nonflammable, noncorrosive, and nonreactive solids and sludges will be placed directly in bulk solid containers (i.e., rolloff, sealed dump trailer) for shipment to off-site landfills as bulk solids. Absorbent materials will be placed in the shipping containers to eliminate free liquids. Solids and sludges which exhibit the characteristics of flammability, corrosivity, or reactivity will be handled in the liquid

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drums, either in their original container (if it is intact) or in an overpack container. Solids and sludges that are flammable and otherwise amenable to incineration will be transported in drums to an off-site incinerator. Other individual drummed solids and sludges will be transported for off-site disposal in landfills.

Leaking and open-topped drums of liquid waste will be transferred to the drum repackaging and staging area by a front-end loader. Here, the liquid contents will be transferred to a clean, intact drum. It is D'Appolonia's intent to limit to the extent practicable the amount of liquid wastes that need to be handled in individual containers. Vacuum-type tanker trucks will be used to remove the fluids from drums of compatible liquids, thereafter being treated as a bulk liquid. Such liquids may be transported for incineration or for treatment as an aqueous-based fluid. Nonpumpable liquids will be handled in individual drums. Liquids that are not amenable to incineration or treatment will be solidified using appropriate absorbent materials. Once solidified, these liquids will be treated as solid materials and handled accordingly.

After the accessible drums in an area are packaged and staged, work crews will then begin sampling, testing, and handling of underlying, previously inaccessible drums in that area.

3.2.4 Loading and Transportation

Waste will be loaded and transported from the Hranica site in the following types of vehicles:

- Bulk solid containers (i.e., rolloff, sealed dump trailer) for specific drummed solids and sludges and certain solidified liquids
- Enclosed vans of compatible drummed liquids and solids
- Vacuum-type tanker trucks containing bulk liquids.

AR300126

Trailers and vans will be lined and covered as necessary to preclude waste leakage during transportation. Before leaving the site, all vehicles will be carefully inspected by D'Appolonia personnel and all waste transportation manifests will be completed. D'Appolonia will subcontract waste transportation of the various waste materials to the licensed transporters identified in Table 3.

3.2.5 Management and Disposal

D'Appolonia will subcontract the off-site disposition of waste materials from the Hranica site to several permitted facilities specializing in the various waste types. These licensed facilities are delineated in Table 4.

3.3 ADDITIONAL SITE CLEANUP

D'Appolonia plans the cleanup of wastes other than drums to proceed after all of the drums are removed from the Hranica site. The exception is potentially contaminated debris which congests work areas; these materials will be decontaminated or removed during site preparation.

3.3.1 Ash and Contaminated Soil Removal

The ash residue from prior waste burning at the site and visibly contaminated soil will be sampled in place using hand augers and/or test pits excavated by the construction equipment available at the site. Samples will be analyzed in the D'Appolonia laboratory using the same basic protocol as applied to drummed wastes (Section 3.2.2). Once characterized sufficiently for manifesting, the ash and soil will be excavated using a backhoe and/or front-end loader and loaded directly into dump trailers for off-site transportation. These trailers will be lined with six-mil-thick plastic sheeting and covered with heavy canvas tarpaulins. All necessary waste transportation manifests will be completed before each truck leaves the site. Transportation and disposal methods and subcontractors are listed in Tables 3 and 4.

AR300127

3.3.2 Incineration Vat Removal

D'Appolonia will remove any liquids from the incineration vats using vacuum trucks and/or pumps and treat this liquid as a hazardous waste. After the liquid is removed, a small truck-mounted crane will be used to load these structures onto transportation vehicles (i.e., flatbed trailers with sideboards). If cutting is required, it will be carried out under the strict supervision of the D'Appolonia site manager. Tables 3 and 4 identify the methods and proposed subcontractors for transporting and disposing of these vats.

3.3.3 Tank Decontamination

D'Appolonia plans to decontaminate the bulk liquid storage tanks at the site to the extent practicable and eliminate the need for removal and off-site disposal of these vessels. The outside surfaces of these tanks will be wiped with a suitable solvent and rinsed with water. The rinse water and subsequent wipe samples will be analyzed (i.e., heavy metals, organics) to verify completeness of cleaning.

The inside of each tank will likewise be washed with a suitable solvent and rinsed with water. The spent solvent and water will be removed from the tanks through the use of a vacuum truck or by pumping to a tanker truck. The rinse water (and a second solvent rinse, if necessary) will be analyzed (i.e., heavy metals, organics) to verify the thoroughness of decontamination.

Spent solvent and rinse waters will be transported off site for incineration or treatment, as appropriate (Tables 3 and 4).

3.4 SUPPORT SERVICES

3.4.1 Preparedness Plan Development

A site preparedness plan will be prepared and submitted to the Pennsylvania DER for approval prior to the waste handling operations. This plan will address the following topics:

AR300128

- Internal and external communication systems
- Fire control equipment
- Spill control equipment
- Decontamination equipment.

Sections 3.1.3.1, 3.1.4, and 3.1.4.1 of this proposal outline the provisions planned by D'Appolonia for work at the Hranica site.

3.4.2 Contingency and Emergency Plan Development

Before the start of on-site waste handling operations, D'Appolonia will prepare and submit a contingency and emergency plan for the Hranica site work for approval by the Pennsylvania DER. This plan will describe D'Appolonia's plans for responding to any fires, explosions, or unplanned releases of hazardous materials to the air, soil, or surface water. This plan will detail emergency response procedures, designate emergency coordinators, and describe the available emergency equipment. Section 3.1.3.2 of this proposal outlines D'Appolonia's emergency provisions for work at the Hranica site.

3.4.3 Waste Analysis Plan

D'Appolonia will prepare a detailed waste analysis protocol for the Hranica site work and submit this plan to PPG for approval. This plan, which is outlined in Sections 3.2.1 and 3.2.2, will define the following:

- Sampling techniques for drummed materials, ash residue, visually contaminated soil, potentially contaminated debris, tank liquids, tank surfaces, and tank decontamination fluids
- Preparation of composite samples
- Waste characterization testing
- Subsequent waste analysis.

3.4.4 Security

Security provisions at the Hranica site will be comprised of the following:

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- 24-hour-per-day guard service
- Installation of a rope barrier and appropriate warning signs around the site perimeter
- Installation of a lockable vehicular gate across the site entrance road.

All D'Appolonia site workers and other site personnel will be required to sign in and out during each work shift. No unauthorized personnel will be permitted entry to the site.

3.4.5 Documentation

D'Appolonia will collect and manage pertinent site information, including:

- Waste container inventory data
- Sampling records
- Waste characterization and analysis data
- Waste transportation manifests
- Waste generation reports required by federal and state regulatory agencies
- Site daily activity logs
- Health and safety program implementation reports (e.g., medical records, employee training records, accident reports).

All waste containers will be uniquely designated by a code number and all inspection, sampling, analysis, manifesting, and generation report data will be keyed by such code numbers.

AR300130

4.0 SCHEDULE

Figure 2 presents D'Appolonia's proposed schedule for completing the specified scope of work at the Hranica site. Assuming issuance of a notice to proceed on March 1, 1983, we estimate that all project work will be completed by September 1, 1983. Key intermediate milestones are as follows:

- Completion of all required site plans and procedures - April 1, 1983
- Approval of site plan and procedures - May 1, 1983
- Mobilization - April 20, 1983
- Commencement of waste handling operations - May 10, 1983
- Completion of drummed waste removal - July 31, 1983
- Completion of additional site cleanup - August 15, 1983

Our schedule accounts for normal weather delays and our expectations for review periods by PPG and the Pennsylvania DER.

AR300131

TABLES

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TABLE 1
RESULTS OF DRUMMED
WASTE INVENTORY

BASIS	DESCRIPTION	NUMBER OF DRUMS COUNTED ⁽¹⁾	TOTALS
Labeling	PPG label, painting, or marking	8,800	14,740
	Alcoa label, painting, or marking	2,740	
	Other label, painting, or marking	640	
	No label, painting, or marking	<u>2,560</u>	
Size	30 gallon	13,320	14,740
	55 gallon	<u>1,420</u>	
Condition	Empty	3,910	14,740
	• Salvageable (as drums)	200	
	• Debris	<u>3,710</u>	
	Partially Full	6,220	
	• Leaking/Open	3,730	
	• Intact	<u>2,490</u>	
	- Bung Removeable	250	
	- Piercing Required	<u>2,240</u>	
	Full	4,610	
	• Leaking/Open	920	
Contents	• Intact	<u>3,690</u>	10,830
	- Bung Removeable	370	
	- Piercing Required	<u>3,320</u>	
	Single Phase	8,120	
	• Solid	6,500	
	• Sludge	1,080	
	• Liquid	<u>540</u>	
	Multiphased	2,710	
	• Solid/Liquid	1,410	
	• Sludge/Liquid	870	
	• Sludge/Solid	<u>430</u>	

(1) All counts rounded to the nearest 10 drums.

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TABLE 2
WASTE CATEGORIES
AND ADDITIONAL TESTING REQUIREMENTS

WASTE CLASSIFICATION	ADDITIONAL TESTING REQUIREMENTS(1)							
	EP TOXIC METALS	GC VOLATILE ORGANIC SCAN	PCB TESTING	BTU VALUE	SULFUR AND CHLORINE CONTENT	TOC	GC/MS SCAN	OTHER SPECIFIC CATIONS-ANIONS
<u>Materials Requiring Special Handling</u>								
• Water Reactive	-	-	-	-	-	-	-	S
• High TOX	-	A	A	-	-	-	I	-
• Sulfur or Cyanide Containing	-	-	-	S	S	L	-	S
<u>Inorganic Wastes</u>								
• Inorganic Acids	A	-	-	-	-	L	-	S
• Inorganic Bases and Neutrals	A	-	-	-	-	L	-	S
• Inorganic Oxidizers	A	-	-	-	-	L	-	S
<u>Organic Wastes</u>								
• Organic Acids	-	A	S	S	S	-	I	-
• Organic Bases and Neutrals	-	A	S	S	S	-	I	-
• Organic Oxidizers	-	A	S	S	S	-	I	-
• Flammable Wastes	-	A	A	A	A	-	I	I

ADDITIONAL TESTING REQUIREMENTS(1)

(1) Legend: A B

A - All Composite waste samples of this type.
I - Spot checks on larger waste lots.
L - Liquid wastes for treatment as aqueous stream only.
S - Special case wastes.

TABLE 3
PROPOSED WASTE TRANSPORTATION SUBCONTRACTORS

WASTE TRANSPORTER	VEHICLE TYPE(S)	WASTE(S) TO BE TRANSPORTED
Dart Trucking, Inc. Canfield, OH	20-cubic-yard dump trailers	Bulk solids for landfilling <ul style="list-style-type: none"> • Drummed solids and sludges • Solidified drum liquids • Contaminated soil
	40-foot enclosed vans	Wastes handled in individual drums
	Flat bed trailers with sideboards	Incineration vats for landfilling
Ross Transportation Services, Inc. Grafton, OH	5,000-gallon vacuum-type tankers	Wastes for incineration <ul style="list-style-type: none"> • Bulk liquids • Drummed liquids • Drummed solids and sludges • Tank decontamination fluids
R & R Sanitation Services Randolph, NJ	5,000-gallon vacuum-type tankers	Wastes for incineration <ul style="list-style-type: none"> • Bulk liquids • Drummed liquids • Drummed solids and sludges
		Aqueous-based liquids for treatment <ul style="list-style-type: none"> • Equipment washwater • Tank decontamination rinse waters
Sechan Industries, Inc. Portersville, PA	20-cubic-yard dump trailers	Bulk solids for landfilling <ul style="list-style-type: none"> • Ash residue
D'Appolonia Waste Management Services, Inc. Pittsburgh, PA	Dump trailers Flat beds Enclosed vans	Empty drums

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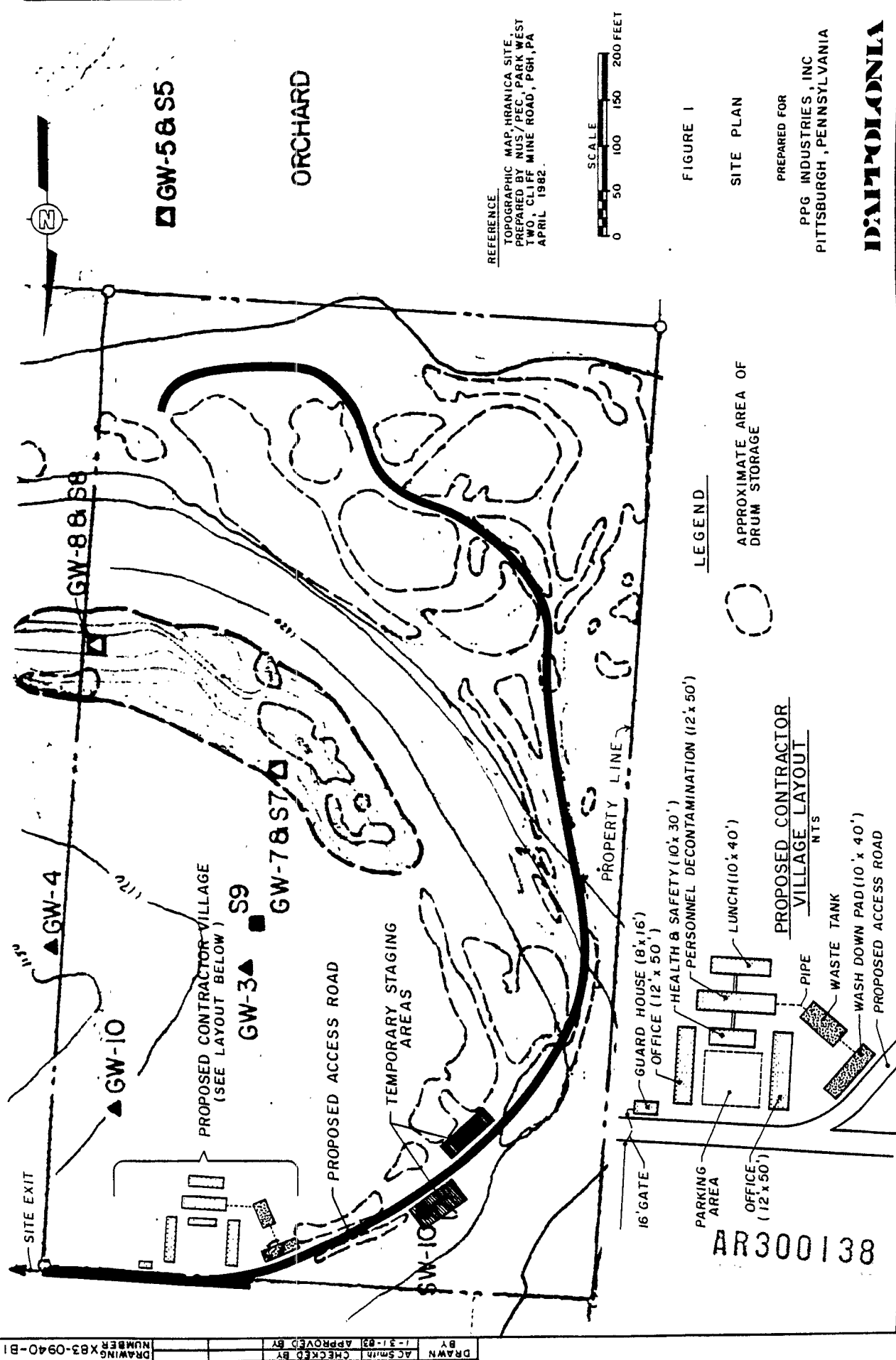
TABLE 4
PROPOSED WASTE DISPOSAL SUBCONTRACTORS

DISPOSER	MANAGEMENT METHOD	APPLICABLE WASTE(S)
Bakerstown Container Corporation Bakerstown, PA	Drum reclaim/ salvage	Salvageable empty drums
J. P. Greco Sons, Inc. Tarentum, PA	Steel salvage	Clean scrap/empty drums
Buffalo Township Landfill Sarver, PA	Sanitary landfill	Nonsalvageable empty drums
Chem-Clear Wayne, PA	Water treatment	Aqueous-based liquids (including tank rinse waters)
Ross Incineration Services, Inc. Grafton, OH	Incineration	Wastes to be incinerated <ul style="list-style-type: none"> • Bulk liquids (including tank rinse solvents) • Drummed liquid • Drummed solids and sludges
Fondessy Enterprises, Inc. Oregon, OH	Secure landfill	Wastes to be landfilled <ul style="list-style-type: none"> • Bulk solids • Drummed solids and sludges • Solidified drum liquids • Contaminated soil • Contaminated debris
Sechan Industries, Inc. Portersville, PA	Secure landfill	Ash residue Contaminated debris

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FIGURES

AR300137



PPG INDUSTRIES, INC.
PITTSBURGH, PENNSYLVANIA

DIARY ONLY

19-053 HENNING AB 5M, INC. FOR PA

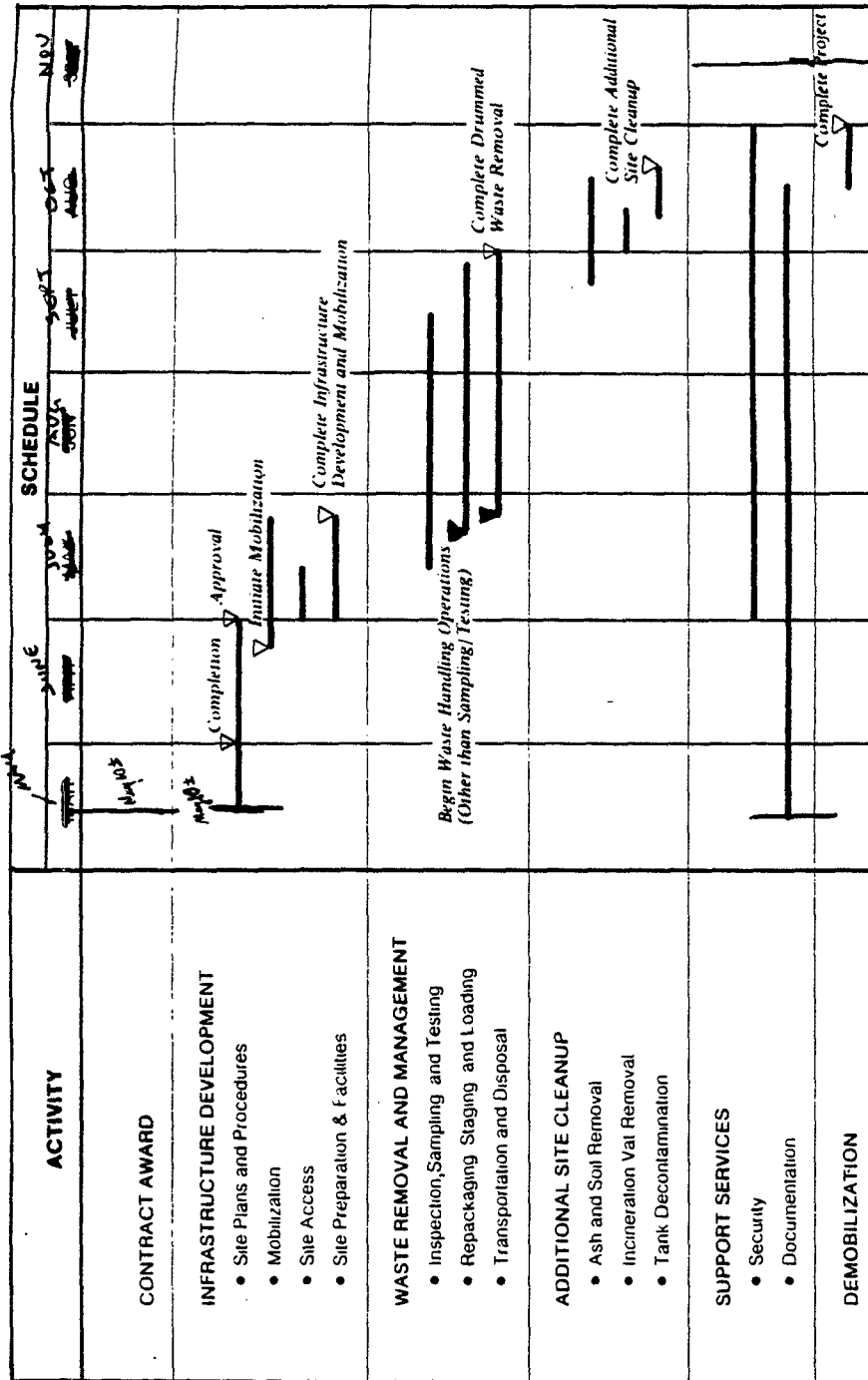


FIGURE 2

PROJECT SCHEDULE

PREPARED FOR
 PPG INDUSTRIES, INC.
 PITTSBURGH, PENNSYLVANIA

DAYTON

AR300139

ORIGINAL
(Red)

APPENDIX
C

AR300140

APPENDIX C

D'APPOLONIA - PREPAREDNESS, PREVENTION, AND CONTINGENCY PLAN
WASTE DISPOSAL SITE CLEANUP
HRANICA SITE, BUFFALO TOWNSHIP, PENNSYLVANIA
JULY 1983

AR300141

Project No. X83-1344-DW

June 83

v. 1; July 83

D'APPOLONIA

CEILING

Preparedness, Prevention, and Contingency Plan

Waste Disposal Site Cleanup Hranica Site

Buffalo Township, PA

PPG Industries, Inc.
Pittsburgh, Pennsylvania

ALCOA
Pittsburgh, Pennsylvania

AR300142

Preparedness, Prevention, and Contingency Plan
Waste Disposal Site Cleanup
Hranica Site

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D'APPOLONIA

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<u>TABLE NO.</u>	<u>TITLE</u>
1	Drummed Waste Inventory
2	Emergency Equipment

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<u>FIGURE NO.</u>	<u>TITLE</u>
1	Site Location Map
2	Site Plan

AR300147

1.0 INTRODUCTION

D'Appolonia Waste Management Services, Inc. (D'Appolonia), will conduct the cleanup of the Hranica abandoned hazardous waste site in Buffalo Township, Pennsylvania under contract to PPG Industries, Inc., Coatings and Resins Division (PPG) and the Aluminum Company of America (Alcoa). The purpose of this work is to remove all drummed wastes, empty drums, liquids stored in tanks, visibly contaminated soil, ash residues, certain other contaminated debris, and incineration vats from the site and dispose of these materials in accordance with all applicable federal and state hazardous waste regulations. A further objective is to decontaminate, as necessary, any tank from which liquid is removed, or dispose of such tanks as hazardous waste if decontamination is not feasible.

This document constitutes the Preparedness, Prevention, and Contingency Plan (PPC) for the project as required by the Commonwealth of Pennsylvania, Department of Environmental Resources (DER). The health and safety procedures to be implemented are given in detail to provide a health and safety manual for the project but, wherever possible, elements of the plan pertaining to emergency response are summarized and indexed for quick reference.

The PPC Plan and Laboratory Analysis Protocol constitute the special project procedures to be employed at the Hranica site cleanup. The D'Appolonia Project Manager will ensure continuous adherence to all procedures during the performance of the work. In no case may work be performed in a manner that conflicts with the intent or the inherent safety and environmental conservatisms expressed in these procedures. These documents have been reviewed by the Pennsylvania DER and revised (Revision 1; July 1983) to respond to their comments.

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2.0 GENERAL DESCRIPTION OF THE PROJECT ACTIVITY

2.1 BACKGROUND

During the period 1966 through 1974, the Hranica site was used for the disposal of industrial wastes generated by the PPG Springdale, Pennsylvania facility and the Alcoa facility at Logans Ferry, Pennsylvania. The Hranica site location is shown in Figure 1. The PPG wastes consisted primarily of paints, coatings, resins, and solvents, and the Alcoa wastes were principally comprised of vacuum still residue and aluminum pastes and powders. Wastes are held in approximately 15,000 30- or 55-gallon metal drums (Table 1) and in several large liquid storage tanks. Prior to the use of the site by PPG and Alcoa, the site owner had accepted household refuse and possibly other wastes (e.g., domestic and industrial) for placement in an on-site landfill.

At the Hranica site, wastes were burned in incineration pits and vats or ignited directly in the drum containers. The ash residue from the burning operation was then dumped on the ground surface. When regulatory officials would no longer allow burning of the wastes, these materials were left intact or spilled onto the ground surface.

2.2 SITE CHARACTERISTICS

The general layout of the site is shown in Figure 2. The approximate locations of the drum staging and repackaging areas are shown, along with proposed access roads and D'Appolonia's proposed facilities for site operations. The perimeter of the site will be delineated with a rope barrier and appropriate warning signs to restrict access, and a full-time security guard will patrol the site.

The Hranica site will be divided into three distinct work zones as follows (Figure 2):

- Contaminated zone - The area in which the waste materials will be handled in their present locations and placed in staging areas.

AR300149

- Neutral zone - The area in which personnel, equipment, and vehicles will be decontaminated.
- Site safety zone - The area in which the site facilities are located and the probability of contamination minimal.

Distinct administrative controls will be applied to each site zone. During operations, these zones will be clearly marked with flagging.

2.3 DRUMMED WASTE HANDLING AND REMOVAL

The handling and disposal of drummed waste will be accomplished through five basic work steps, each of which is described in the following paragraphs.

2.3.1 Inspection and Sampling

Work crews will inspect each waste container and withdraw samples from accessible drums in each of 32 designated storage areas. Intact drums will be allowed to remain in place until they are ready for loading and any leaking drums will be transferred to the repackaging area. Samples will be extracted, bottled, and shipped to the D'Appolonia laboratory in Murrysville, Pennsylvania. Opened drums will be closed or covered to await loading.

2.3.2 Characterization and Testing

Based on the laboratory testing results, drummed wastes will be categorized according to their physical states (i.e., liquid, solid, or sludge). In addition, they will be classified as organic or inorganic compounds, and as acids, bases, oxidizers, and flammable compounds. A special-handling classification will be given to materials which are water reactive, contain sulfides or cyanide, or which exhibit high levels of organic halogens.

2.3.3 Repackaging and Staging

Processing of waste will be dependent on composition of drum contents. All nonflammable, noncorrosive, and nonreactive solids and sludges will

AR300150

be loaded directly in bulk transportation containers (i.e., sealed dump trailers) using a backhoe fitted with a drum-handling grapple. Other solids and sludges will be handled in individual drums, either the original container if intact, or in an overpack container. All drums of liquid wastes will be placed by the backhoe/grappler in the upturned bucket of a front-end loader and transferred to the drum repackaging area. Here, all liquid wastes will be transferred to clean, intact drums, and compatible liquids will be bulked. No liquid waste transfers will occur outside the designated repackaging area. Liquid waste that cannot be incinerated or treated will be solidified in drums by adding sufficient clay-based oil absorbents directly to the contained liquids; the liquid contents of full or nearly full drums may need to be placed into two drums to accommodate the absorbent. All packaged waste will be staged in the drum staging area for appropriate shipment.

2.3.4 Loading and Transportation

Waste will be loaded and transported from the Hranica site in the following types of vehicles:

- Bulk solid containers (i.e., sealed dump trailer) for specific drummed solids and sludges and certain solidified liquids
- Enclosed vans of compatible drummed liquids and solids
- Vacuum-type tanker trucks containing bulk liquids.

Trailers and vans will be lined with six-mil plastic sheeting and covered with heavy canvas tarpaulins as necessary to preclude waste leakage during transportation. Before leaving the site, all vehicles will be inspected and decontaminated (as necessary) and all waste transportation manifests will be completed.

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2.3.5 Management and Disposal

D'Appolonia will subcontract the off-site disposition of waste materials from the Hranica site to several permitted facilities specializing in the various waste types. Selection of off-site treatment and disposal facilities will be coordinated with the Pennsylvania DER and U.S. Environmental Protection Agency (EPA).

2.4 OTHER WASTE REMOVAL

D'Appolonia plans the cleanup of wastes other than drums to proceed after all of the drums are removed from the Hranica site. The exception is potentially contaminated debris which congests work areas; these materials will be decontaminated or removed during site preparation.

2.4.1 Ash and Contaminated Soil Removal

The ash residue from prior waste burning at the site and visibly contaminated soil will be sampled in place using hand augers and/or test pits excavated by the construction equipment available at the site. Samples will be analyzed in the D'Appolonia laboratory using the same basic protocol as applied to drummed wastes (Section 2.3.2). Once characterized sufficiently for manifesting, the ash and soil will be excavated using a backhoe and/or front-end loader and loaded directly into dump trailers for off-site transportation. These trailers will be lined with six-mil-thick plastic sheeting and covered with heavy canvas tarpaulins. All necessary waste transportation manifests will be completed before each truck leaves the site.

2.4.2 Incineration Vat Removal

D'Appolonia will remove any liquids from the incineration vats using vacuum trucks and/or pumps and treat this liquid as a hazardous waste. After the liquid is removed, a small truck-mounted crane will be used to load these structures onto transportation vehicles (i.e., flatbed trailers with sideboards). If cutting is required, it will be carried out under the strict supervision of the D'Appolonia site manager. These

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materials will then be transported to appropriate disposal facilities as hazardous waste.

As an alternative to off-site disposal of these wastes, it may be possible to remove the refractory brick and dispose of this material (as hazardous waste) and decontaminate the steel vats using water or other solvents. If this alternative appears feasible and prudent, the decontamination procedure to be followed will be identical to the steel tanks at the site.

2.4.3 Tank Waste Removal and Decontamination

D'Appolonia plans to decontaminate the bulk liquid storage tanks at the site to the extent practicable and eliminate the need for removal and off-site disposal of these vessels. The outside surfaces of these tanks will be wiped with a suitable solvent and rinsed with water. The rinse water and subsequent wipe samples will be analyzed (i.e., heavy metals, organics) to verify completeness of cleaning.

After removing the liquid wastes in the tanks using vacuum trucks, the inside of each tank will be washed with a suitable solvent (e.g., water, hexane, kerosene) and rinsed with water. The spent solvent and water will be removed from the tanks through the use of a vacuum truck or by pumping to a tanker truck. The rinse water (and a second solvent rinse, if necessary) will be analyzed (i.e., heavy metals, organics) to verify the thoroughness of decontamination.

Liquid wastes, spent solvent, and rinse waters will be transported off site for incineration or treatment, as appropriate.

3.0 EXISTING EMERGENCY RESPONSE PLANS

3.1 WORKER HEALTH AND SAFETY PLAN

The hazardous environmental protection plan for all personnel working or visiting at the site will include the following components: AR300153

- Medical surveillance
- Employee training
- Personnel protection
- Personnel service facilities.

A trained health and safety officer will be present on site to implement the health and safety program.

3.1.1 Medical Surveillance

Personnel involved in site activities will be provided with a medical examination before the onset and at the completion of operations (Form HS-1; Appendix A). The medical examination will include a complete medical and work history; a physical examination with emphasis on the skin, renal, and hepatic systems; and laboratory examinations to include blood tests for liver and renal functions, a complete blood count, and a urinalysis. In addition, personnel will be medically evaluated prior to the onset of operations for their ability to wear personal respiratory protection and other potentially stressful equipment. This examination will include an evaluation of the cardiorespiratory system and a pulmonary function test.

3.1.2 Employee Training

D'Appolonia will provide occupational hazard training to employees before the commencement of work. This training will consist of the following:

- Acute and chronic effects of hazardous chemicals potentially present at the Hranica site
- The requirements, effectiveness, and limitations of personal protection equipment
- Proper use and fitting of respiratory and other protective gear
- Prohibitions in waste handling areas, including beards, contact lenses, eating, smoking, chewing, and working when ill

AR300154

- Appropriate responses to emergency situations, including the order of notification for site management personnel.

Follow-up training will be provided for any major changes in operational procedures. The health and safety officer will document all training sessions (Form HS-2; Appendix A).

3.1.3 Personnel Protection

Employees working within the potentially contaminated zones of the site will be provided safety equipment and protective clothing (Form HS-3; Appendix A). The minimum protective equipment required to be worn by these personnel follows:

- Full-body protective coveralls
- Hard hat
- Frontal eye protection with impact-resistant lenses
- Protective steel-toed rubber boots
- Protective gloves with impermeable palms.

Protection equipment will also be supplied to DER and EPA on-site personnel.

To allow continual evaluation of the level of administrative and other protective measures required to provide a safe working environment during site operations, an air quality monitoring program will be employed. This monitoring program will include collection of real-time, semiquantitative data on airborne total organic vapor concentrations in and around the breathing zone of workers. A portable organic vapor analyzer/gas chromatograph (OVA/GC) will be used to collect these data (Section 8.3). Results of this monitoring will be used to establish respiratory protection requirements and effect rapid response to airborne contaminant levels. Action limits and respiratory protection

AR300155

requirements have been established based on comparison of total organic vapor levels to maximum allowable concentrations of specific contaminants expected at the Hranica site (Sections 8.2.1 and 8.2.2).

This personal protection equipment is capable of providing protection for those wastes known to be present at the Hranica site in concentrations estimated from the available data. Additional/substitute equipment will be made available if warranted by conditions encountered during project execution. Such equipment includes the following:

- Self-contained breathing apparatus and supplied air respirators
- Full-face, air-purifying respirators with either front-mounted or back-mounted air intakes
- Impermeable coveralls and splash aprons
- High-gauntlet rubber gloves
- Full-face shields.

3.1.4 Personnel Service Facilities

Within the site neutral zone (Figure 2), D'Appolonia will provide and maintain clean change rooms, lockers, laundry, lunchroom, and shower facilities for all personnel at the project site. Personnel working in the contaminated zone will be required to use these facilities before eating lunch or leaving the site (Section 10.1).

3.2 SITE EMERGENCY PROCEDURES

The health and safety program for the project has been established to allow site operations to be conducted without adverse impacts on worker health and safety. In addition, supplementary emergency response procedures have been developed to cover extraordinary conditions that might possibly occur at the site.

AR300156

3.2.1 General

All accidents and unusual events will be dealt with in a manner to minimize continued health risk of site workers. In the event that an accident or other unusual event occurs, the following procedure will be followed:

- First aid or other appropriate initial action will be administered by those closest to the accident/event. This assistance will be conducted in a manner to assure that those rendering assistance are not placed in a situation of unacceptable risk.
- All accidents/unusual events must be reported to the highest-ranking management person at the site (Chapter 4.0), who is responsible for conducting the emergency response in an efficient, rapid, and safe manner. He will decide if off-site assistance and/or medical treatment is required and arrange for their assistance.
- All workers on site are responsible to conduct themselves in a mature, calm manner in the event of an accident/unusual event. All personnel must conduct themselves in a manner to avoid spreading the danger to themselves and to surrounding workers.

The Project Manager will document all accidents/injuries (Form HS-4; Appendix A).

3.2.2 Responses to Specific Situations

If an employee working in a contaminated area is physically injured, Red Cross first aid procedures will be followed. Depending on the severity of the injury, emergency medical response may be sought. If the employee can be moved, he will be taken to the edge of the work area (on a stretcher, if needed) where contaminated clothing will be removed, emergency first aid administered, and transportation to a local emergency medical facility awaited.

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If the injury to the worker is chemical in nature (e.g., overexposure), the following first aid procedures are to be instituted:

- Eye Exposure - If contaminated solid or liquid gets into the eyes, wash eyes immediately at the emergency eyewash station using large amounts of water and lifting the lower and upper lids occasionally. Obtain medical attention immediately. Contact lenses should not be worn when working with these chemicals.
- Skin Exposure - If contaminated solid or liquid gets on the skin, promptly wash the contaminated skin using soap or mild detergent and water. If solids or liquids penetrate through the clothing, remove the clothing immediately and wash the skin using soap or mild detergent and water. Obtain medical attention immediately.
- Breathing - If a person breathes in large amounts of organic vapor, move the exposed person to fresh air at once. If breathing has stopped, perform artificial respiration. Keep the affected person warm and at rest. Obtain medical attention as soon as possible.
- Swallowing - If contaminated solid or liquid has been swallowed and the person is conscious, give the person large quantities of salt water immediately and induce vomiting. Do not make an unconscious person vomit. Obtain medical attention immediately.

Fire extinguishers will be provided with the equipment used to excavate and handle exhumed materials. If a localized fire breaks out, chemical fire extinguishers will be used to bring the occurrence under control. If necessary and feasible, soil or other inert materials will be placed on the burning area to extinguish the flames and minimize the potential for spreading. Local fire-fighting authorities (i.e., Sarver Volunteer Fire Company) will be contacted for notification and/or assistance.

If an uncontrolled fire develops releasing potentially toxic gases, persons in the immediate vicinity will be evacuated. Only personnel trained in fire fighting and outfitted with proper protective equipment

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will be allowed in the immediate fire area. The designated emergency coordinator will alert local fire-fighting companies.

3.3 BUTLER COUNTY WARNING AND PREPAREDNESS PLAN

The Butler County Emergency Management Agency (BEMA) has developed a Warning and Preparedness Plan for an area within a one-half-mile radius of the Hranica site. The plan treats the warning system, evacuation, and temporary housing of the area residents in the event of a significant accident during the cleanup of the site. The plan is included as Appendix B.

The BEMA plan calls for the D'Appolonia emergency coordinator at the site to notify the Butler County Communications Center if an emergency situation develops that warrants evacuation of area residents. The implementation of this plan supplements the present PPC plan for events requiring outside agency notification. The PPC plan addresses accidents that are limited to the site and the immediate area only.

4.0 ORGANIZATIONAL STRUCTURE FOR IMPLEMENTATION

Implementation of the PPC plan will be the responsibility of the highest ranking individual on site at the time of the emergency. The ranking of on-site personnel is as follows, from highest to lowest:

- Project Manager
- Site Superintendent
- Health and Safety Officer
- Construction Foremen.

The order of notification within this organizational structure in case of an emergency will be part of the health and safety training program (Section 3.1.2) and posted at various locations at the site.

The responsibilities and duties of the organizational structure will be identical to those of the emergency coordinator (Chapter 16.0) because the individuals involved will be the same (cf. Chapters 15.0 and 17.0).

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5.0 MATERIAL AND WASTE INVENTORY

The majority of the wastes currently stored at the Hranica site are classified as hazardous under the Resource Conservation and Recovery Act (RCRA) regulations as follows:

- PPG sludges include specifically listed wastes (e.g., solvents).
- PPG off-specification paints and resins may be ignitable and/or fail the EP toxicity test due to the presence of heavy metals.
- Alcoa still residues may be ignitable and aluminum powders may be reactive with water.

The PPG wastes consist primarily of paints, coatings, resins, and solvents. The Alcoa wastes are principally plating wastes, metal sludges, pastes, and powders. Visibly contaminated soil, ash residue, tank liquids, and any contaminated debris will also be handled as hazardous waste.

A total of 14,736 drums were counted at the Hranica site by D'Appolonia personnel. Two field engineers/surveyors independently counted all drums in each of 32 distinct areas of the site.

About 3,910 of the drums at the site are currently empty (per RCRA definition). Most of the drums that contain materials appear to be at least partially full; many (42 percent) remain intact.

Of the drums which currently contain wastes, more than 8,000 are full or partially full of solids and sludges. It is estimated that about five percent of the nonempty drums are full or partially full of liquids. Much of the liquid appears to be rainwater that has collected in leaking and open-top drums. Some liquid oil in drums has been observed.

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The storage tanks at the site are suspected to contain about 25,000 to 30,000 gallons of oil, solvents, and rainwater which has collected in open-top tanks. One tank is known to contain approximately 1,500 gallons of oil contaminated with more than 5,000 parts per million of polychlorinated biphenyls (PCBs).

6.0 SPILL, LEAK, AND FIRE PREVENTION AND RESPONSE

6.1 SPILLS OR LEAKS

In handling contaminated materials at the Hranica site, a continuous effort will be made to prevent and control any spillage of contaminated materials. The spill control program is founded upon the following:

- Providing physical controls to the extent possible in areas where such spills are most likely to occur.
- Proceeding in a deliberate and controlled fashion in handling all hazardous materials.
- Providing materials and equipment for immediate response to spills.

The D'Appolonia Project Manager and Site Superintendent are responsible for the immediate action in case of a spill. The construction foremen and health and safety officer will also be made aware of the necessary steps to be taken in the event of a spill.

The following areas/activities are considered to be those which present the highest probability of materials spillage:

- Handling of deteriorated drums of liquid wastes
- Transfer of liquid wastes to the repackaging area
- Removal of liquids from storage tanks
- Staging of liquid wastes.

Drainage control features will be incorporated in the staging areas to contain any spills of liquid materials that occur in this area. The area will be cleared and graded and overlain with plastic sheeting

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covered by sand and gravel. An earthen berm will be constructed around the perimeter of the area to contain spilled materials. Shovels and absorbent materials will also be made available for immediate response to any spills during drum handling.

In general, the steps to be taken in the event of a spill of hazardous materials during work at the Hranica site follow:

- Containment - If the spilled material is a liquid, the first reaction is to contain the material to the smallest area possible. If the amount of liquid material is large, the nearest available construction equipment will be used to construct a small berm around the spill area. If the material spillage is small, soil will be added directly to the spilled material as an absorbent. (This will be the case for spillage of single drum contents.)
- Isolation - The area of the spill will be isolated from traffic patterns by responsible persons in the immediate area. Surveyor's flagging on wooden posts or laths will be used to designate the spill area and isolate it from traffic. In no case will the responsible person leave the spill area until steps are implemented for control and cleanup.
- Control - An immediate assessment will be made to determine whether the spilled material presents a fire or airborne gas release problem. If either of these events are of concern, soil or other absorbent will be mixed with the spilled material and/or the area may be covered with a thin plastic sheet or canvas tarpaulin while awaiting cleanup.
- Cleanup - Spilled materials will be mixed with soil and handled as a bulk solid hazardous waste for disposal.

The limit of any liquid spill and the adequacy of cleanup will be determined primarily by visual inspection and, if deemed necessary, soil sampling.

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6.2 FIRE PREVENTION AND CONTROL

The following provisions will be made to prevent and/or control fires during the conduct of the work at the Hranica site:

- Portable dry chemical fire extinguishers (ABC type) with each work crew and in the facilities area at the site
- Two-way radio communication between the work crews and the site office and external telephone communication from the site office
- Prohibition of smoking or open flames in work areas
- Coordination with local fire-fighting companies and posting of the emergency telephone number at the site office
- Use of nonsparking hand tools to the extent practicable
- Storage of fuel for the construction equipment away from waste handling areas
- Monitoring of air quality to detect excessive levels that could lead to fires and/or explosions
- Training of personnel in fire prevention and emergency response procedures.

No routine on-site welding or cutting is planned. In the event such activity is required, the D'Appolonia Project Manager will work with the welders to ensure it is performed in a safe manner.

7.0 MATERIAL COMPATIBILITY

All materials at the site will be characterized by the D'Appolonia central laboratory and such test results will be returned to the site prior to any in-field mixing of wastes. Materials will be bulked only when chemical compatibility allows. Materials which are found to be highly corrosive will be packaged in plastic, corrosion-resistant drums. Accidental mixture of materials will be treated as a spill

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(Chapter 6.0) and any violent or toxic gas-releasing reaction will be handled as an emergency situation with the appropriate responses initiated.

After preliminary sample screening (e.g., color, texture, viscosity, specific gravity, flammability), composite samples will be formed for basic RCRA classification testing. Drum samples of unique wastes will be tested individually; when groups of drum samples containing apparently identical materials are encountered, composite testing of the contents of this group of drums will be performed. Compositing will be based on the physical similarity of materials and other indicators of compatible/identical materials (e.g., labeling). The RCRA characterization tests to be performed are the following:

- pH
- Flash point
- TOX (by Bielstein's copper wire test) as a check for the presence of halocarbons, including PCBs
- Water solubility
- Water reactivity
- Presence of oxidizers
- Spot check for sulfides (if pH is greater than 3)
- Spot check for cyanide (if pH is greater than 3).

Additional testing requirements for these wastes are related to manifesting and the potential methods for off-site disposition. Additional testing will be performed on composited samples. Once the laboratory testing is completed, the results will be returned to the site operations personnel for guidance in further waste handling.

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8.0 INSPECTION AND MONITORING PROGRAM

8.1 GENERAL APPROACH AND OBJECTIVES

Visual inspections of equipment in the waste handling areas will be made daily by the Site Superintendent, or his designee, to identify potential problems which could lead to leaks, spills, or accidents in that area. Special attention will be given to liquid transfer facilities. Visual inspections of the drum staging area will also be made to identify if any containers have deteriorated, creating a spill potential.

The air quality monitoring program for personnel health and safety will also serve to identify potential emergency situations. Concentrations of airborne hydrocarbons in the breathing zone of workers will be continuously monitored by the health and safety officer using a portable OVA/GC. High vapor levels around waste storage areas would be an early indicator of leaking containers. High levels in the materials handling area would identify leaks or spills not immediately evident. Daily air quality monitoring surveys of the site perimeter and other areas throughout the site will also serve as indicators of localized problems.

8.2 SAFETY STANDARDS

D'Appolonia has designed safety standards for all on-site personnel. These parameters will be used for the hazardous working conditions that are associated with waste handling operations. All on-site employees will follow the operating procedures consistent with these standards.

It is to be emphasized that the use of the personnel protective equipment by D'Appolonia employees is related to the nature and concentration of the chemical exposure. Action levels for employee protection and emergency actions will be employed based on observations related to airborne concentrations of contaminants during the work site air quality monitoring.

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8.2.1 On-site Action Levels

Within site work limits, OVA/GC sampling data will be used to effect rapid response to airborne contaminant levels. Action limits have been established based on interpretation of total organic vapor readings as compared to maximum allowable concentrations. A response scheme has been devised, defining general actions to be taken at observed sustained concentrations of total organic vapors during area monitoring. In developing these actions, the conservative assumption is made that much of the observed organic vapor concentrations is attributable to benzene, an ubiquitous solvent with a very low allowable exposure limit:

- Threshold Limit Value (TLV) - Allowable exposure in an eight-hour work shift of a 40-hour work-week - 10 parts per million.
- Short-Term Exposure Limit (STEL) - Maximum concentration over a 15-minute period - 25 parts per million.

In this context, "sustained" implies a concentration that maintains its level for 15 minutes. The basic responses to sustained concentrations of organic vapors observed during area monitoring are as follows:

- Level I - Total organic vapor concentration of 10 parts per million: Require use of respirators within work area.
- Level II - Total organic vapor concentration of 50 parts per million: With respirators in use, improve the data to define what types of contaminants are contributing to this concentration by taking samples for specific compounds in the GC mode of the OVA/GC instrument.
- Level III - Total organic vapor concentration of 100 parts per million: With respirators in use, take immediate action to reduce the concentration to which workers are exposed, such as relocating workers to better work locations, temporary suspension of an operation, lowering the production rate, and other accepted means of exposure control.

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- Level IV - Total organic vapor concentration of 200 parts per million: Improve the degree of respiratory protection provided to the workers.
- Level V - Total organic vapor concentration of 1,000 parts per million: Remove workers from highly contaminated areas and treat as emergency situation.

If a particular job function appears to result consistently in high employee exposure (i.e., more than 0.5 TLV), rotation of workers, additional employee training for improved work habits, and/or other administrative action will be taken to reduce chronic exposure levels.

8.2.2 Perimeter Action Levels

For the perimeter monitoring, specific action levels in response to concentrations of total organic vapor will be as follows:

- 25 parts per million - Notify Project Manager and keep apprised of status; continue site work with emphasis on locating and controlling contaminant sources.
- 50 parts per million - Take immediate action to determine constituents; stop/reduce production until source of contamination is controlled.
- 100 parts per million - Treat as emergency situation.

8.3 AIR MONITORING

Air quality monitoring is an integral part of the health and safety program; the collected data serve as input to decisions regarding worker protective measures, routine work procedures, and emergency events. The air quality monitoring program requirements can be defined as follows:

- Continuous, real-time measurement of total organic vapor concentrations
- Intermittent, real-time measurement of selected organic concentrations.

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Portable instruments are used to provide real-time, semiquantitative data on total organic vapor concentrations in and around the breathing zone of workers and along the site perimeter. The OVA/GC uses a flame ionization detector (FID) to measure hydrocarbon concentrations in air. This detector is predictably responsive to chlorocarbons.

Air monitoring may also include the real-time analysis of selected compounds through the use of the GC mode of the OVA/GC. These measurements provide a strip chart readout of concentration for semiquantitative determination. The work atmosphere will be analyzed with the GC whenever Level II total organic vapor concentrations are reached.

Site perimeter air monitoring is designed to provide adequate warning to off-site personnel against exposure to levels of certain hazardous substances which may be present in the ambient air during the trenching operations. The perimeter air monitoring will be performed at a minimum of two times per day and consist of surveys along the site perimeter using the OVA/GC. Such surveys will document airborne organic vapor concentrations at various upwind and downwind locations; the results of these analyses will also be compared to perimeter action levels (Section 8.2.2) to effect what, if any, steps are required to reduce potential off-site exposures.

The health and safety officer, or his designee, will document the air quality measurements daily, including corresponding meteorological data and site work activities (Form HS-5; Appendix A).

9.0 PREVENTIVE MAINTENANCE

There are only a few types of equipment used in the planned cleanup process which are subject to failure in ways that would endanger public health and safety (e.g., vacuum trucks, grappler). This equipment will be routinely inspected to maintain their operational effectiveness. Records will be kept of dates, inspector, and maintenance or adjustments.

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required. All transportation vehicles must be inspected, certified, and maintained in accordance with U.S. Department of Transportation regulations.

10.0 HOUSEKEEPING PROGRAM

10.1 PERSONNEL DECONTAMINATION

Within the site neutral zone (Figure 2), D'Appolonia will provide and maintain clean change rooms, lockers, laundry, lunchroom, and shower facilities for all personnel at the project site. At the beginning of the work shift, workers will leave their street clothes in lockers and put on the protective clothing provided. Personnel working in the contaminated zone will be required to remove their protective clothing and wash their face and hands prior to eating, drinking, or smoking in the designated lunch trailer. At the end of the work shift, each person working in a contaminated zone will be required to remove his outer clothing and use the shower facilities before changing into his street clothes and leaving the site. Coveralls will be placed in a hopper and laundered daily at the site. Other health and safety equipment will be placed in employee-designated stalls within a health and safety equipment trailer. This equipment will be cleaned and maintained regularly by the health and safety officer. Toilets will be available in the personnel decontamination facility. Sewage will be collected in a holding tank for off-site disposal. Waste wash water from the facility will collect in a separate holding tank for disposal.

10.2 EQUIPMENT DECONTAMINATION

An equipment washdown facility will be constructed in the neutral zone near the site entrance to allow decontamination of transportation vehicles and equipment leaving the contaminated zone (Figure 2). The washdown facility will consist of a concrete slab placed slightly below grade which is curbed and drains to a sump. Equipment will be washed using a high-pressure water spray. Collected wash waters will be analyzed (e.g., heavy metals, organics, other indicators) and disposed

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off site in accordance with the results of the analyses. If the wash-water is found to be uncontaminated it may be recycled to the equipment decontamination facility. Contaminated water will be handled as hazardous waste.

10.3 DRUM HANDLING AND STORAGE

The drum repackaging and staging areas will be cleaned daily to keep equipment and work surfaces neat and orderly. Empty drums for repackaging will be stored out of the way of the handling area and only brought up as needed. Repackaged waste will be stored in a drum staging area (Figure 2) and shipped off site as soon as possible to avoid drum congestion.

11.0 SECURITY

Security provisions at the Hranica site will be comprised of the following:

- 24-hour-per-day guard service
- Installation of a rope barrier and appropriate warning signs around the site perimeter
- Installation of a lockable vehicular gate across the site entrance road.

All D'Appolonia site workers and other site personnel will be required to sign in and out during each work shift. No unauthorized personnel will be permitted entry to the site.

12.0 EXTERNAL FACTORS

No external factors are considered to have a reasonable potential of creating health, safety, or pollution problems at the site or in the surrounding area. The site is protected from flooding by its upland topography. Daytime site activities could all proceed in the event of a

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power outage, except for laboratory analysis, but temporary delay of this activity would not pose a safety or pollution problem.

13.0 INTERNAL AND EXTERNAL COMMUNICATIONS OR ALARM SYSTEMS

Internal communications will be maintained through extension phones in the facilities buildings and portable two-way radios. Telephones will be in both offices, the guard house, and the health and safety office. Radios will be carried by the Project Manager, site superintendent, client representative, health and safety officer, and construction foremen. Additionally, radios will be given to any personnel conducting tasks involving unusual risks. The radios and telephones will be used as an alarm system in the event of an emergency.

External communications will be through the regular telephone system at the site. These will be used to alert area authorities of emergency situations.

14.0 EMPLOYEE TRAINING PROGRAM

The health and safety officer will design and implement a training program for all site personnel to develop safe working habits (Section 3.1.2). The training program will instruct site employees on day-to-day operations and responding effectively to any emergency. Procedures for the use, repair, and inspection of monitoring equipment will be provided. The appropriate response to fire, explosions, and the shutdown of operations will be reviewed. Emergency procedures, evacuation routes, areas of the site that have restricted access, methods used for project decontamination, and general safety will be covered in the training. Records of site personnel having completed this training will be maintained on site.

Follow-up training will be provided for any major changes in operational procedures.

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15.0 LIST OF EMERGENCY COORDINATORS

The following is a ranked list (highest to lowest) of emergency coordinators who will be at the Hranica site. The highest ranking individual on site at the time of an emergency will be the acting coordinator.

- Bradley P. Bundy
- Daniel C. Shields
- Zachary A. Smith
- John Boylan.

Refer to Chapter 17.0 for positions and telephone numbers of these individuals.

16.0 DUTIES AND RESPONSIBILITIES OF THE EMERGENCY COORDINATOR

In the event of an imminent or actual emergency situation, the emergency coordinator will be notified via two-way radio, telephone, or by employees. His primary duty will be to assess the nature and severity of the emergency and initiate the response plan accordingly. It is anticipated that potential emergency situations will be limited to the site area; therefore, the emergency coordinator will dispatch site employees and emergency response equipment to handle the situation. It is his responsibility to do this in an orderly and prudent manner so as not to endanger the health and safety of employees. In the event that the emergency situation poses a threat to the surrounding environment or external emergency response equipment is required, the emergency coordinator will be responsible for notifying the appropriate agencies.

It will be the responsibility of the emergency coordinator to determine if evacuation of the site by all personnel is required and, if so, to initiate the evacuation plan (Chapter 20.0). If evacuation of area residents is indicated, he will be responsible for notifying Butler County authorities (Chapter 18.0).

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Once an emergency situation has been stabilized, the emergency coordinator will be responsible for defining the extent of cleanup necessary and the actions to be taken to prevent recurrence of similar incidences. He will see to it that the identified measures are carried out before work is resumed.

The emergency coordinator will be responsible for documenting the emergency situation after it has occurred and been resolved. He will provide a report to the Project Manager and the owner's site representative describing the following:

- The event (including date and time) that necessitated the notification and the basis for that decision
- Date, time, and names of all persons/agencies notified and their response
- Resolution of the incident (including duration) and the method/corrective action involved.

This report will be submitted within three working days of the resolution of the event. A report will also be prepared within 15 days to be submitted to the Pennsylvania DER containing:

- Name, address, and telephone number of the individual filing the report
- Name, address, and telephone of the installation
- Date, time, and location of the incident
- A brief description of the circumstances causing the incident
- Description and estimated quantity by weight or volume of materials or wastes involved
- An assessment of any contamination of land, water, or air that has occurred due to the incident
- Estimated quantity and disposition of recovered materials or wastes that resulted from the incident

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- A description of what actions the installation intends to take to prevent a similar occurrence in the future.

17.0 CHAIN OF COMMAND

All of the key personnel are employees of D'Appolonia; the D'Appolonia office address and telephone numbers follow:

D'Appolonia Waste Management Services, Inc.
10 Duff Road
Pittsburgh, PA 15235
Telephone: 412-243-3200

The following is a list of the home addresses and telephone numbers of key employees who should be contacted in the event of an emergency:

- Name: Bradley P. Bundy
Position: Project Manager
Address: 5076 Northlawn Drive
Murrysville, PA 15668
Telephone: 412-733-1709
- Name: Daniel C. Shields
Position: Site Superintendent
Address: 3804 Stone Top Drive
Monroeville, PA 15146
Telephone: 412-856-5747
- Name: Zachary A. Smith
Position: Health and Safety Officer
Address: 3804 Stone Top Drive
Monroeville, PA 15146
Telephone: 412-856-5747
- Name: John F. Boylan
Position: Construction Foreman
Address: 5805 Searl Terrace
Bethesda, MD 20816
Telephone: 301-320-4244

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18.0 LIST OF AGENCIES TO BE NOTIFIED

18.1 RELEASE OF A HAZARDOUS SUBSTANCE, FIRE, OR EXPLOSION WHICH THREATENS AREA RESIDENTS

In Butler County all calls for emergency assistance are directed to a central communications center which dispatches appropriate response personnel and equipment. Because of its proximity to the Hranica site, the Sarver Volunteer Fire Company will most likely be the first responder to site emergencies requiring off-site assistance. Instigation of the Warning and Preparedness Plan (Appendix B) relative to neighborhood evacuation is made by the site emergency coordinator through the communications center.

Off-site releases of hazardous or toxic substances or other emergencies that threaten local residents require notification of the National Response Center and cognizant personnel of the Pennsylvania DER and U.S. Environmental Protection Agency.

- Butler County Communications Center - 412-353-9555
- National Response Center - 800-424-8802
- Pennsylvania DER
 - Regional Park Office - 412-865-2079
 - Meadville Regional Office - 814-724-8526
- U.S. Environmental Protection Agency, Region III - 215-597-8131
- Pennsylvania Fish Commission - 412-865-2383

18.2 ON-SITE FIRE, EXPLOSION, OR NEED FOR EMERGENCY MEDICAL ASSISTANCE

- Butler County Communications Center - 412-353-9555

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18.3 NEIGHBORHOOD EVACUATION

- Butler County Communications Center - 412-353-9555

19.0 EMERGENCY EQUIPMENT

Table 2 is a list of emergency equipment kept at the site with location and intended use. The list will be posted in key places at the site. Location, identification, and use of equipment will be covered in employee training sessions. In addition, the Sarver Volunteer Fire Company will be equipped with special foam fire-extinguishing equipment to handle any chemical or oil fires.

20.0 EVACUATION PLAN FOR INSTALLATION PERSONNEL

All on-site personnel will be made familiar with the evacuation plan. The plan will be posted at several locations on site and all workers will be given a copy. Local medical personnel, police, fire, and health officials will be notified of the evacuation plan prior to the start of site activities.

All available vehicles located in the clean zone will be used in the evacuation. All personnel will exit the site via the entrance gate, unless specific conditions preclude this point of egress. An alternate route of egress is across the western site boundary and then north along this line to Hranica Drive. Personnel should report to an upwind regroup area. The regrouping areas will be designated prior to commencement of work. The emergency coordinator is responsible to account for all workers.

21.0 EMERGENCY RESPONSE CONTRACTORS

Due to the anticipated limited extent of potential pollution releases of public health and safety hazards, D'Appolonia will act as its own

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emergency response contractor. D'Appolonia's corporate headquarters are located in close proximity to the Hranica site (Penn Hills in Pittsburgh), allowing rapid mobilization of personnel and equipment. Through the Project Manager, the appropriate emergency response could be initiated on short notice.

22.0 AGREEMENTS WITH LOCAL EMERGENCY RESPONSE AGENCIES AND HOSPITALS

The Butler County Emergency Management Director is aware of the Hranica cleanup project, including site location and access, hazardous wastes handled, evacuation plans for site personnel and area residents, and potential need for services. This awareness is detailed in the Butler County Warning and Preparedness Plan (Appendix B). Arrangements with local fire, police, and hospital services are implicit in this plan but also have been made directly by D'Appolonia through contacts with the services to clarify potential needs for assistance. Refer to Chapter 18.0 for all telephone numbers.

23.0 POLLUTION INCIDENT HISTORY

D'Appolonia has conducted several cleanups of drummed hazardous wastes, including ones involving paints and paint solvents. The preparedness, prevention, and contingency plans for these projects were essentially the same as the one described here. No pollution events or significant health and safety problems have ever resulted from these projects. The present plan has evolved from previous experience, with a strong emphasis on "prevention."

24.0 IMPLEMENTATION SCHEDULE

Due to the short duration of the cleanup project, all elements of the PPC plan are complete as contained herein. The plan will be implemented intact from the start-up day of the project.

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TABLES

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TABLE 1
DRUMMED WASTE INVENTORY

BASIS	DESCRIPTION	NUMBER OF DRUMS COUNTED ⁽¹⁾	TOTALS
Size	30 gallon	1,420	14,740
	55 gallon	<u>13,320</u>	
Condition	Empty		14,740
	• Salvageable (as drums)	200	
	• Debris	<u>3,710</u>	
	Partially Full	3,910	
	• Leaking/Open	3,730	
	• Intact		
	- Bung Removable	250	
	- Piercing Required	<u>2,240</u> <u>2,490</u>	
	Full	6,220	
	• Leaking/Open	920	
Contents	• Intact		10,830
	- Bung Removable	370	
	- Piercing Required	<u>3,320</u> <u>3,690</u>	
	Single Phase		
	• Solid	6,500	
	• Sludge	1,080	
	• Liquid	<u>540</u>	
	Multiphased	8,120	
	• Solid/Liquid	1,410	
	• Sludge/Liquid	870	
	• Sludge/Solid	<u>430</u> <u>2,710</u>	

(1) All counts rounded to the nearest 10 drums.

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TABLE 2
EMERGENCY EQUIPMENT

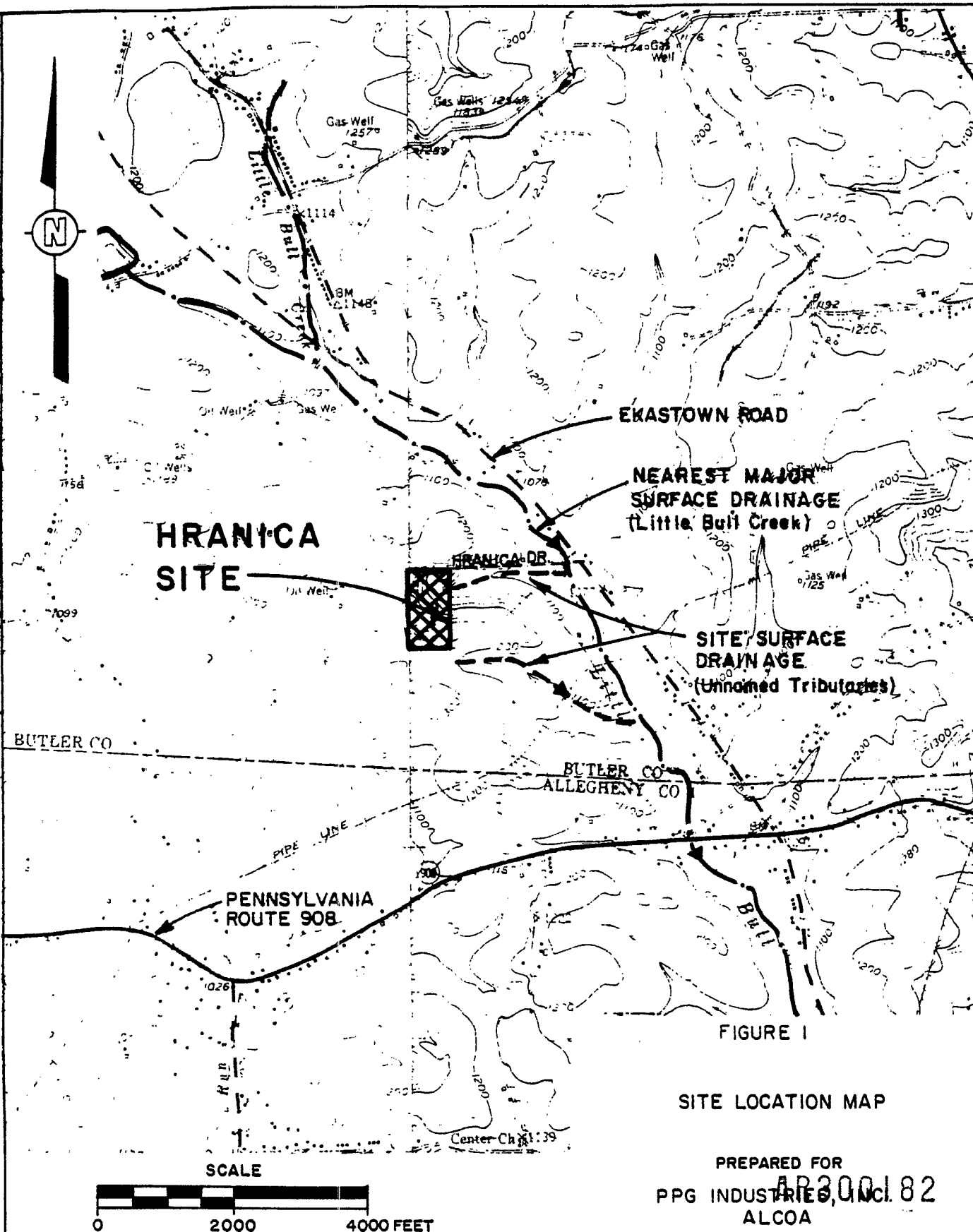
ITEM	LOCATION	INTENDED USE	CAPABILITIES AND LIMITATIONS
Two-way Radios	Carried with key site personnel, base-unit in main office	Rapid communication of information for emergency response	Voice contact throughout entire site; 1 mile range
First Aid Station <ul style="list-style-type: none"> • Stretcher • First aid kit • Oxygen 	Safety office	Emergency first aid treatment	
Emergency Showers	Decontamination trailer	For personal contact with chemicals	Full showers
Eyewash Station	Drum handling area, decontamination trailer	For eye contact with chemicals	16-gallon flooding system
Fire Extinguishers	Decontamination trailer, field offices, drum handling area, field foreman's truck	To extinguish small fires	ABC type; 15-pound
Emergency Respirators	Safety office, drum handling area	To replace contaminated or broken respirators	-
Supplied Air Apparatus	Safety office, drum handling area	To supply clean air in case of gas release	Scott Air Packs; 30-minute tanks
Absorbent (Clay Based)	Drum handling area	For spill containment	Several tons stored at site for various uses
Free-Extinguishing Foam	Sarver Volunteer Fire Company	To extinguish chemical or oil fires	Appropriate nozzles and 100 gallons of three percent foam concentrate

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FIGURES

AR300181

DRAWN BY	Trs	CHECKED BY	LMB	6/19/83	DRAWING NUMBER X83-1344-A1
	5-24-84	APPROVED BY	LMB	6/19/83	



REFERENCE

U.S.G.S. 7.5 MINUTE TOPOGRAPHIC QUADRANGLES,
CURTISVILLE, PA. (1969PR) AND FREEPORT, PA.
(1953) SCALE: 1:24000

19 1253 HERCULENE. ABB SMITH CO. FGH. PA

SITE LOCATION MAP

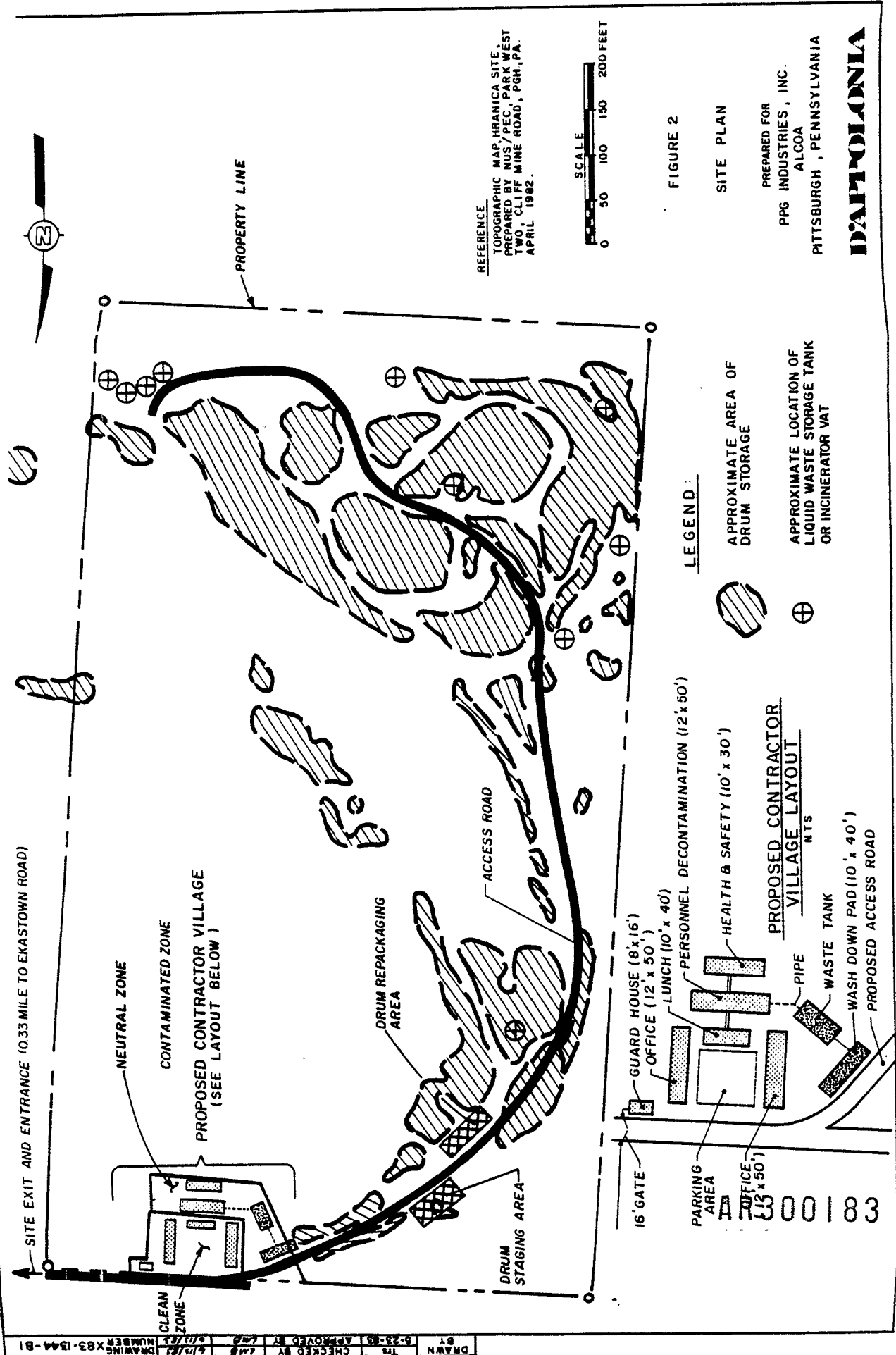
PREPARED FOR

PPG INDUSTRIES, INC. 82

ALCOA

PITTSBURGH, PENNSYLVANIA

D'APPOLONIA



BY	DATE	APPROVED BY	DATE	DATE	DATE
DRWN	9-22-83	CHKD	9-22-83	9-22-83	9-22-83
NUMBER	X83-1344-B1				

FIGURE 2

SITE PLAN

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PPG INDUSTRIES, INC.
ALCOA
PITTSBURGH, PENNSYLVANIA

DART-OLONIA